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Milk Fever.*

By Professor J. Russell Greig, M.R.C.V.S.,
Royal (Dick) Veterinary College, Edinburgh.

Mr. President and Gentlemen,—Let me, in the first place, say that it was with a sense of deep appreciation that I accepted your invitation to present a paper on the subject of Milk Fever to a joint meeting of the Midland Counties and the Derbyshire Veterinary Medical Associations.

I believe that this is the first occasion on which the subject has been discussed before a Divisional meeting since what I may describe as the modern theories of the etiology of milk fever have been promulgated, and recent research work published. Although our views are still necessarily in a state of flux, this seems to me an appropriate time to take a survey of the present position, and to discuss generally those factors which appear to have an influence on the production of the disease.

Milk fever is so well known to you in its clinical manifestations and in its response to modern treatment that a systematic discussion of these familiar aspects of the subject would be profitless, and I propose to confine myself chiefly to a consideration of the etiology, touching casually on such other points as may have a bearing upon it.

Milk fever seems to have been recognised and recorded since the early part of the nineteenth century; in Britain, Price (1806)(1) and Skellet (1807)(2) being among the first to describe the disease.

That so serious an affection was not mentioned by the older writers has been explained by assuming that it only developed in such incidence as justified its record towards the end of the eighteenth century and, as has been pointed out, this corresponds with the development of a more intensive system of milk production. The disease appears to have steadily increased in its rate of occurrence and was associated with a very heavy mortality.

To-day, we are happy in the possession of a specific remedy, and in the enjoyment of our possession we are apt to regard as of no account the old methods of treatment, several of which, while they met with comparatively little success, nevertheless seem to have proved of benefit in a proportion of cases, and since the matter may have some bearing on the pathology of the disease we may give it passing consideration.

I would remind you that a proportion of cases recovers spontaneously and for that reason it is probable that the value of this or that treatment was frequently wrongly assessed; I shall therefore mention only a few of the more distinctive methods.

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In 1806, Price(3) advised the promotion of sweating by the use of hot packs and clothing. The procedure appears to have had little support until 1883, when Cox(4) strongly recommended its practice, and in the following year Russell(5) recorded that excellent results had been obtained by this treatment. In eight cases which recovered five were *in extremis*.

Zander, in 1874,(6) advised the somewhat heroic practice of scarification of the croup and loins, followed by the repeated application of hot fomentations to these parts. He claimed 50 per cent. of recoveries; but the number of his cases is not stated.

Phlebotomy was long regarded as of pronounced value, both as a preventive and curative. Professor William Williams(7) was a strong advocate of free bleeding, and remarked upon the improvement in the pulse which invariably followed the removal of several quarts of blood in the comatose stage. A low blood-pressure is still believed to be associated with the comatose stage, and if this be true, the beneficial effects which followed free bleeding are of distinct interest.

Chloral hydrate, first advised, I think, by McConnell, was very largely used and was claimed by many practitioners as a virtual specific, but, while it seemed to bring about a ready response in some cases, in others it appeared to have no effect. Hoare(8) remarks, "The manner in which an hypnotic when given to a comatose subject brings about recovery is a mystery."

The year 1897 marks an epoch in the history of milk fever, as in that year Schmidt, acting on the theory that there was being produced in the udder a toxin or enzyme which brought about decomposition of the mammary epithelium, injected an antiseptic in the form of a 1 per cent. aqueous solution of potassium iodide: the results were startling in their almost invariable success.

The correctness of Schmidt's theory was later disproved in that it was shown that what he had regarded as evidence of epithelial disintegration were normal tissue elements, and it was thereupon suggested that the iodine which was injected probably possessed some specific power in neutralising the pathogenic factor.

It should be noted (and this fact has hitherto been largely overlooked by myself among others) that a comparatively small quantity of the solution was at first injected; a quantity, in fact, even less than the quantity of milk removed from the udder previous to injection. Schmidt did not attempt to effect mammary distension, but was content to introduce a small quantity of solution which he then proceeded to "massage throughout the gland."

Schmidt(9) records that some practitioners employed injections of small quantities of a concentrated solution of potassium iodide (10 grammes in 40

grammes of water), and that in several cases recoveries were obtained. Peter[10] injected intravenously 10 grammes of potassium iodide in two litres of water with success; Wessel[11] claimed 75 per cent. of recoveries with this treatment, the value of which is vouched for by other writers, including Hauptmann[12] and Schmidt himself.

I have perhaps sufficiently indicated my point that these obsolete procedures should not be forgotten in that they may have some bearing on the pathology of the disease.

At first, practitioners were enjoined to be careful to exclude the entrance of air during the injection, but this was a matter of some ditficulty and it was found that when air was accidentally injected with the fluid, no harm resulted: it was later believed to be of actual value in aiding the dispersal of the fluid throughout the gland and for this reason it was eventually adopted as a routine method; the udder was first partially injected with the iodide solution and thereafter air was pumped in.

Anderson, of Skanderborg,[13] was the first to practise inflation with air alone, and the older methods were soon replaced by simple mammary insufflation and distension.

So it came about that the Veterinary Profession was privileged to have presented for its solution a problem in Etiology as intriguing, surely, as any which has confronted Medical Science.

An apparently healthy, prime milch-cow, after performing successfully and without mishap a perfectly normal function, *i.e.*, parturition, is suddenly struck down by a serious disease, all cases of which present similar characters of occurrence and the same general train of symptoms: a disease from which, in all probability, she will die unless she be subjected to a mechanical process almost ridiculous in its simplicity; whereupon she makes a recovery that is not only complete, but almost as rapid as was the attack. The problem is the more attractive by reason of its apparent simplicity.

We seem to be confronted with an enigma-tantalus: could we comprehend the nature of the disease, the meaning of the dramatic recovery following inflation should become evident; could we understand the action of the remedy, the nature not only of milk fever, but of the whole group of eclampsias to which it appears to belong, should become capable of conception.

Conditions of Occurrence.

In discussing the conditions of occurrence, I propose to take a course which is open to your criticism. I shall assume that the disease we call "milk fever" occurs, not only in the parturient cow, but at any stage of lactation and even in the non-lactating cow; that it need not manifest itself in the form so familiar to us when it occurs during the puerperium, but may appear some few weeks after calving as a sub-acute dyspepsia with or without attendant convulsions ("post-parturient dyspepsia"); that it also occurs in the parturient goat, ewe, and sow, and in the goat and ewe during late lactation.

I do not scruple to make these suggestions, because I believe that in them I am on fairly secure ground, and I would further suggest, although I am now in the realms of speculation, that some cases presenting the milk fever syndrome which occur in the fed bullock (so-called "staggers") are allied in their essential pathology to the disease as it occurs in the parturient cow.

My arguments that all these conditions are of the same essential pathology are simple:—

(1) All respond readily to simple mammary insufflation (with the exception, of course, of "staggers" in the bullock).

Now, since mammary insufflation represents a simple mechanical process—(the results are the same, whether air, antiseptic solutions, or sterile water be injected)—then it seems reasonable to believe that whatever effect is elicited, it must be essentially the same in all cases and that the diseases which readily respond to the production of that effect must be the same in their essential pathology.

(2) The factors, other than parturition, which appear to predispose to the occurrence of these conditions are similar to those of milk fever.

(3) All, with one exception, present clinical symptoms apparently identical with those of milk fever, but even the exception, post-parturient dyspepsia, occasionally terminates with symptoms identical with those of milk fever.

Attempts have been made in the past to differentiate several types of parturient milk fever. While that may be convenient for the purpose of clinical reference, I believe it is wholly wrong when considering the disease in its general pathology. I believe that, in general, *all* cases of milk fever in the parturient cow can be regarded as exhibiting a well-defined syndrome occurring in two stages:—(1) Tetany and convulsions succeeded by (2) Coma. In some cases the first stage is pronounced and lengthy, in others the second stage developes rapidly. To recognise several clinical types is fallacious and tends to confuse the real issue.

Now, if I am right (I say *if* I am right) in assuming that these diseases represent one pathological entity, then let us see what inferences can be drawn from this premise.

(*a*) Milk fever occurs in the lactating cow, long past her puerperium; then parturition is not an *essential* factor in the etiology.

(*b*) Milk fever occurs in the non-lactating cow in whose udder milk secretion has entirely ceased; therefore lactation is not an *essential* factor in the etiology.

On the other hand, since the disease is so commonly associated with the first milk-flow following parturition both these factors must be regarded as very important *predisposing* causes.

Let us now turn to a consideration of the factors which appear to determine the occurrence of the disease as it is met with in its most familiar form, *i.e.*, following parturition in the cow. It is to be realised that these factors are predisposing and not exciting causes. There are many cases of milk fever in which

some of these factors are absent, while on the other hand several are associated with parturitions that are not followed by milk fever.

Predisposing Causal Factors.

(1) *Distribution.*—The disease occurs most commonly in certain districts, and practitioners have frequently noted that individual farms furnish cases of milk fever, whereas the disease is seldom encountered in others. Again, as many as five or six cases may occur at short intervals in a herd in which previously the affection was rarely seen. This might indicate the presence of a factor to which all the animals are exposed and to which certain are susceptible or, conversely, the absence of some factor (dietetic or otherwise) the presence of which would tend to prevent an attack. It has been considered that such a factor might be calcium, and the point will be referred to later.

(2) *Age.*—Cows are most commonly attacked between the fifth and the tenth years of age. It has been noted that the commencement of the period of greatest susceptibility corresponds with the period of greatest milk yield. Primiparæ are very rarely attacked.

(3) *Type of Cow and Conditions of Keep.*—While deep-milking cows in high condition are most liable to attack, milk fever is occasionally encountered in poor, lean animals; but more especially when these have been the subjects of generous feeding towards the end of pregnancy. The danger of a rich nitrogenous diet in the last stage of pregnancy has long been recognised, but cases occur in cows at pasture, especially on lush, rank grass, and a condition of sub-acute dyspepsia is not uncommonly noted previous to and succeeding the attack. Great difference of opinion is expressed as to the conditions of keep most likely to produce the disease. While some have observed the majority of their cases in closely confined stalled cows, others have experienced a greater number of cases when the cows are out at grass in the summer.

(4) *Conditions at Parturition.*—In practically every case the birth has been easy and uncomplicated. The disease may follow abortion, and the retention of the placenta is a fairly common concomitant. It has been observed that milk fever seldom, if ever, follows the birth of twins, but the point wants confirmation. It has also been observed, but again confirmation is lacking, that the period of non-lactation previous to the calving is usually short.

(5) *Weather.*—Attempts have been made to associate the attack with various types of weather, and it has been noted that periods of hot, muggy, thundery weather are likely to produce a crop of cases.

(6) *Fatigue and Excitement.*—Forced exertion, fatigue and excitement must be regarded as predisposing causes. The common occurrence of milk fever in freshly-calved cows which have been sent a long journey by rail or road has often been remarked.

(7) *Influence of Milking.*—The complete emptying of the udder after calving is an important causal factor. While in many cases the milk secretion is markedly diminished prior to the appearance of the notable symptoms, the sudden and complete withdrawal of milk may precipitate the onset of the attack. On the other hand, the avoidance of complete milking for the first 72 hours after calving is perhaps the most valuable means we possess for the prevention of the disease. Cows suckling their calves are rarely attacked; this is usually explained on the ground that the milk is drawn off in small quantities, and that the excitement consequent upon separating the calf from the cow does not occur.

(8) *Liability to Recurrence.*—That the disease shows a tendency to recur with each parturition is well known. This does not necessarily mean that one attack renders the subject more susceptible to another; it rather suggests that some factor which ordinarily plays an important part in the resistance of the body to the disease is absent.

Let us now consider briefly those other conditions which respond to mammary inflation, and which I believe to be very closely related to parturient milk fever.

A.—Post-parturient Dyspepsia.

This condition is frequently met with in the South and West of Scotland, but appears to be more common in some districts than in others. It most frequently affects heavy milking cows in high condition. While cows which have reached their prime are principally affected, it, more commonly than milk fever, attacks young animals and even heifers. The influence of rich nitrogenous feeding is well recognised, and the disease is almost invariably associated with an easy parturition. A subject of post-parturient dyspepsia is likely to be similarly attacked after the next calving, or she may then develop typical milk fever.

It will be seen from the foregoing that the predisposing factors are very similar to those of milk fever.

The attack usually develops within two to four weeks after calving. The symptoms are somewhat indefinite and, in general, represent a sub-acute dyspepsia. Dulness is followed by suspension of appetite and rumination; the intestinal movements are sluggish, the fæces being rather solid, dark coloured and containing excessive mucous film; the milk secretion is markedly diminished and the udder is distinctly flaccid. The skin becomes dry and harsh, and the coat uneven and dirty in appearance. There is no fever or other marked constitutional disturbance, but occasionally there is developed a persistent and penetrating mawkish odour which is principally exhaled from the mouth, but which also affects the milk.

These symptoms usually persist for a period varying from one to three weeks, when they may clear up spontaneously, although recovery is usually hastened by aperient and stomachic treatment. Insufflation

of the udder, in the great majority of cases, brings about a ready response, the symptoms quickly disappearing.

It will be noted that no tetanic or convulsive symptoms have been described, but, in a proportion of cases, the symptoms of dyspepsia are succeeded by those of acute milk fever.

B—Milk Fever Complex occurring at Periods other than the Puerperium and responding to Mammary Inflation.

Disease conditions which cannot be clinically distinguished from milk fever and which are often referred to as "staggers" present themselves at every period of lactation. In many of these cases the cause of the attack is obscure, but three factors may be mentioned:—

(1) *Dietetic Error.*—Under this may be included overfeeding or the use of a too-highly nitrogenous diet. Cases are also met with in cows grazed on rich pastures, especially those carrying a high proportion of clover. These conditions, which are sometimes referred to as "stomach staggers," also occur in sheep and goats, in which animals, also, inflation occasions a rapid recovery.

It is worthy of notice in this connection that digestive disturbance is frequently also associated with parturient milk fever, and is the characteristic symptom in post-parturient dyspepsia.

The term "staggers" is applied without distinction to a number of conditions of obscure etiology. Many cases do not respond to inflation, and it has been observed that these differ clinically from the milk fever complex in exhibiting diarrhœa rather than constipation; but the point requires to be verified.

(2) *Excitement and Fatigue.*—While, as has been already mentioned, these may act as important causal factors in parturient milk fever, they are also known to be the means of precipitating the syndrome as it occurs at a period other than the puerperium, not only in the lactating, but in the "dry" cow and ewe. There are several records of the occurrence of such cases at markets and fairs. Inflation is usually followed by rapid recovery.

(3) *Œstrum.* That the milk fever syndrome in the lactating but non-pregnant cow is frequently associated with the period of œstrum, especially the first period following parturition, has been recognised by several practitioners. Since considerable excitement may obtain during the œstral period it is possible that in this we have the cause. On the other hand, the part played by endocrine action in the production of the œstral cycle may yet be found to furnish the explanation.

The findings at autopsy have been meagre and indefinite. Among the more significant conditions described are—a certain degree of engorgement of the abdominal vessels, and sub-involution of the uterus.[14] This latter condition is capable of demonstration during life, but a greater consensus of opinion is required as to its relative frequency as compared with the normal.

Several writers, including Porcher, Albrecht and Nocard have found albuminuria during the course of the attack, but its presence is inconstant; this does not exclude the possibility of nephritis, as it has been shown by Browne (1926),[15] that nephritis need not necessarily be associated with an albuminuria. One would, however, expect to find in such a condition an appreciable rise in the urea and uric acid of the blood, but, according to Hayden and Sholl (1926),[16] the average increase in these nitrogenous end-products in milk fever does not seem to indicate any considerable impairment of renal function. Nevertheless, a series of careful histological examinations of the kidneys seems desirable.

Theories upon the Etiology of Milk Fever.

Cerebral Anæmia.—It has been postulated by several writers that milk fever represents a cerebral anæmia consequent upon an assumed vaso-motor failure and the resultant collection of large quantities of blood in the abdominal area; the decreased abdominal pressure following parturition and the mammary hyperæmia accompanying the commencement of lactation have been advanced as contributory causes.

In support of this hypothesis, several cases have been recorded in which the appearance of the comatose stage of milk fever has been observed following post-partum hæmorrhage, but all attempts to reproduce the typical symptom-complex by copious bleedings have failed. Moreover, as has been pointed out by Marek,[17] in such cases as have been recorded as simulating milk fever, not only blood, but extraneous matter had gained entrance to the peritoneal cavity. In one such case, in which coma was complete, Gebauer[18] mistook the condition for milk fever and inflated the udder; twenty minutes later the cow showed signs of returning consciousness which became complete and continued for about an hour, when coma returned. In other cases of intra-peritoneal hæmorrhage inflation has produced no appreciable effect.

The theory further postulated that inflation, by increasing mammary pressure, drives the blood out of the udder into the general circulation, or in some manner causes contraction of the abdominal vessels and so overcomes the cerebral anæmia. While one can no longer regard cerebral anæmia as the primary factor in the pathogenesis of milk fever, it is conceivable that a failure of the vaso-motor centre may be present in the comatose stage; the theory, however, does not attempt to explain the process of its causation. That splanchnic (sympathetic) stimulation may follow inflation seems probable, and will be discussed later, but the increase in the general blood pressure due primarily to udder distension and occlusion of the mammary vessels would be so slight as to be almost negligible.

Cerebral Congestion.—The earlier theories of Franck and Professor Barlow, of Edinburgh, that the disease

depended upon sudden cerebral congestion, are now regarded as untenable.

Organic Lesions.—The older hypotheses postulating such conditions as thrombosis, fat embolism and apoplexy fell, in face of the rapid and complete recoveries which follow mammary insufflation.

Bacterial Intoxication. — In 1885, Schmidt-Mülheim,[19] in advancing the theory that milk fever represented a form of botulism, based his argument upon certain resemblances in the clinical symptoms. This idea has recently been brought forward again by Pugh (1924),[20] who suggests that the disease results from the absorption of botulinus-like toxins to which the animal is predisposed by the presence of a ketosis which, in turn, is consequent upon faulty fat metabolism at parturition.

This theory has already been rather fully criticised by Professor Henry Dryerre and myself (1925),[21] but attention may here be drawn to the following points :—

Little and Wright (1925),[22] in a quantitative estimation of the acetone bodies in the blood and urine of cases of milk fever, found that there was no significant increase in these bodies as compared with the normal cow, *i.e.*, that there is no ketosis. Hayden and Sholl (1925),[23] in an examination of the urine in twelve cases of milk fever, concluded that acetone bodies " do not seem to be present in consistent pathological quantities." In six of their samples, however, the urine was acid in reaction, so that, while the possibility of an acidosis is not wholly excluded, there appears no justification for the theory that milk fever is caused by a botulin-intoxication consequent upon ketosis.

If milk fever be due to the action of a bacterial toxin, then one must believe that the mechanical process of mammary inflation will not only immediately overcome the *effects* of that portion of the toxin which has already entered into combination with the body tissues, but will destroy the toxicogenic property of the bacterium itself.

Such conclusions cannot be accepted.

Several writers have regarded the disease as an intoxication of bacterial origin and have suspected the uterus, vagina and mammary glands as the probable sites of infection. It has been thought that toxins might be developed in the uterus during the decomposition of the lochia, but these have never been identified as causal factors, and no micro-organism has been found experimentally to produce the disease.

But, while, as has been indicated, I believe that the theory of bacterial intoxication is untenable, the idea of an auto-intoxication is much more attractive.

Auto- Intoxication consequent upon Anaphylaxis.—Marek[24] suggested the possibility of an auto-intoxication following anaphylaxis produced by the absorption of specific proteins from the placenta or the glandular cells of the mammæ, but attempts to reproduce the phenomena of attack by intravenous and intraperitoneal injections of placental emulsions, milk and colostrum proved negative.

Hynd (1925),[25] has recently investigated by polariscope tests the nature of the urinary protein in eclampsia of woman; his results appear to show that lact-albumin, as distinct from serum-albumin, is present. This suggests that lact-albumin is re-absorbed into the blood in which it must be regarded as a foreign protein. Hynd says, " Possibly it may be that small amounts of lact-albumin may find their way into the blood-stream, but that during lactation as a rule immunity to this foreign protein is established. When this immunity is not established, or when a sudden release of lact-albumin occurs corresponding to a shock dose of foreign protein, then eclampsia is the result."

It is possible that this may also apply in milk fever, and further investigation along these lines is highly desirable.

Auto-intoxication consequent upon Endocrine Disorder.—In 1925, my colleague, Professor Henry Dryerre,[26] and I formulated a hypothesis as to the nature of milk fever and those diseases which resemble it in their clinical symptoms and in their response to mammary insufflation. We were of opinion that some light could be thrown on the problems by a consideration of the disease as representing an endocrine dysfunction.

A detailed discussion is unnecessary here, and it will suffice to briefly outline the theory.

I would remind you that the para-thyroid glands are generally assumed to play a part in the neutralisation of toxic metabolites, and it has been shown that they perform the important function of regulating the calcium content of the blood. While the mechanism of their action is by no means clear, it is known that removal or atrophy of the para-thyroids gives rise to a condition of tetany.

It has been found that, in conditions of para-thyreopriva there results a deficiency of calcium in the blood, and since the injection of calcium temporarily relieved the symptoms, it was concluded that the tetany was due to a calcium deficiency caused by the para-thyroidectomy. Later, the presence of a substance, methyl-guanidin, was discovered in the urine of dogs deprived of their para-thyroids, and Paton[27] and his co-workers found that injections of guanidin into the muscles of mammals produced symptoms exactly similar to those occurring during para-thyreopriva.

In animals in which deficient functioning of the para-thyroids has been induced, in addition to the symptoms of tetany followed by coma, there also occur dilation of the pupil, tachycardia and a depressed intestinal movement.

In cases of para-thyroid hypofunction the animal is able to meet the usual metabolic requirements of the body, but it possesses a lessened ability to combat the effects of calls made upon it in excess of the normal. Such a condition is known as latent tetany, and we suggest that cows exhibiting milk fever and the allied diseases to which I have referred may be suffering from this defect. The animal during pregnancy is able to meet the strain of increased metabolism in-

volved, but is on the border-line ; following parturition there is a great increase in protein metabolism, and in the necessity for an increased destruction of toxic metabolites. The more intensive the feeding, the greater will be the danger, for it has been shown that a diet rich in proteins predisposes to the formation of guanidin compounds. At this period, too, the blood calcium, already deficient in quantity, undergoes heavy loss by reason of the secretion of colostrum, and heavy calls are made upon the para-thyroids for its replacement and stabilisation in the tissues. Hence the para-thyroids are unable to cope with the demands made upon them ; toxic metabolites gather in the blood with their consequent sequelæ.

The typical signs of guanidin poisoning are manifest, not only in milk fever, but in the nervous complications of post-parturient dyspepsia and in those cases of " staggers " which respond to inflation.

The circulation of adrenaline in the blood-stream is known to play an important rôle in controlling the rate of oxidation in the tissues, and there is reason to believe that in the conditions under consideration there also exists a sub-normal or only normal secretion of adrenaline, so that the increasing toxæmia fails to be counteracted by an increased outpouring of adrenaline.

In cases of dystocia we may believe that the adrenals are profoundly activated in response to the afferent stimuli produced by severe labour, and in this way there will occur a profuse outpouring of adrenaline into the circulation to be followed by a rapid oxidation of the excessive toxic metabolites in the blood and the consequent prevention of the symptoms of milk fever.

In this way, too, we would explain the curative effects of mammary insufflation. We suggest that the inflation gives rise to powerful afferent stimuli which reflexly produce the outpouring of adrenaline ; oxidation is hastened, the toxins are burnt up and the blood pressure raised.

The distension of the udder by inflation will, by retarding the formation of milk, conserve the supply of calcium in the blood. This may also explain the efficacy of a restricted withdrawal of milk in the prevention of the disease. It has further been shown that small doses of adrenaline increase the excitability of muscle and that the presence of guanidin increases enormously the sensitising effects of adrenaline upon muscle, while the administration of a small dose of adrenaline to an animal with its para-thyroids removed will precipitate the onset of tetany.

From these observations we can correlate the fact that fright, worry or excitement may usher in an attack of the milk fever syndrome, both as it occurs in the lactating, but non-parturient cow, ewe and goat, and in the non-lactating cow. The stimulus of fright or of the distress occasioned by restraint, etc., is sufficient to cause only a comparatively small secretion of adrenaline—enough to sensitise the tissues, but not enough to hasten oxidation rapidly. Likewise an easy birth, by its relatively small disturbance to the animal, elicits only a small secretion of adrenaline.

We may believe that guanidin, which is a by-product in protein metabolism, is normally present in the blood (but especially at parturition) in greater or lesser amounts ; but in parturient milk fever and the other allied conditions it oversteps the danger threshold. As has already been noted, the undoubted beneficial effects which followed free bleeding were difficult of explanation, but if milk fever represent, in part at least, an auto-intoxication by such substances as guanidin, the value of phlebotomy can be understood as representing a removal of toxin from the blood. In the same way, the preventive value of aperients in the last stage of pregnancy is explained on the ground that the formation of guanidin in the bowel and its absorption are facilitated by intestinal stasis. Again, since guanidin production is more readily occasioned by a highly nitrogenous diet, we can correlate the fact that a subsistence diet of straw and roots in the last week or two of pregnancy tends to prevent an attack.

The occasional failure of mammary insufflation to effect a complete cure may be traced to the fact that the insufflation was not pursued to a sufficient degree and hence the necessary stimulus for the reflex secretion of abundance of adrenaline was not initiated or, alternately, that the case represented an unusually heavy guanidin intoxication. The necessity in certain cases for a second or third insufflation of the mammæ may be readily deduced from our hypothesis ; the first treatment gave a secretion of adrenaline only sufficient to carry the animal over a limited period, but not past the danger threshold. The subsequent insufflations completed the cure.

This hypothesis has received considerable support in experimental and clinical evidence, thus :—

Little and Wright (1925),[28] in an investigation on twelve cases, found that the cows when " down " with milk fever showed an average fall of 50 per cent. in the calcium content of the blood. Further, the fall in the calcium content always ran parallel with the severity of the symptoms. After inflation the blood calcium again rose.

These workers state that benefit has been derived from both intravenous and intramuscular injections of calcium chloride in 10 per cent. solutions ; 30 to 40 c.c. being injected, and repeated if required in six to eight hours. When possible, calcium lactate can be given orally every three hours with benefit.

Little and Wright do not agree that the lowered blood calcium should be interpreted as a para-thyroid failure and suggest that it may partly be accounted for in a deficiency of lime in the rations, or by confinement in stalls during the winter when the animals are denied a sufficiency of sunlight and an adequate supply of fresh green (vitamine containing) foods which are necessary for the proper assimilation of lime. They point out that while the cow suffers very considerable loss of calcium during pregnancy, the sudden loss of calcium at the commencement of lactation is particularly striking. They estimate that the secretion of half a gallon of colostrum would be sufficient to deplete the blood of the whole of its

lime, supposing there was no reserve store of lime in the body from which the blood might be replenished.

It will be apparent that if inflation brings about an increased adrenaline outflow a rise in blood pressure should follow. Seitter,(29) by insufflating the udder of healthy cows, found that the normal blood pressure could be raised within half an hour by an average of 55 per cent.; he also found that blood pressures lowered to 51 per cent. of normal as the result of the administration of drugs such as chloral hydrate, could rapidly be restored to normal by insufflating the udder. The effects of the insufflation appear to have lasted about eight hours. Similar, but much less rapid, results were obtained by the injection of adrenaline (method and quantity not stated). If one assumes that mammary insufflation stimulates (directly or indirectly) the adrenal glands, such effects upon the blood pressure are readily comprehensible.

Again, it is well known that the production of an increased adrenaline secretion immediately raises the glucose content of the blood, and hyper-glycæmia will result. Widmark and Carlens (1925),(30) experimenting upon normal lactating cows and goats, found that mammary inflation caused an immediate hyperglycæmia of short duration (it appears to reach its maximum in about 60 to 90 minutes), and this was most pronounced in heavy milking animals. After reaching its maximum the hyper-glycæmia rapidly falls.

Adrenaline has long been recommended as an ancillary to udder inflation. Again, since the secretion of adrenaline brings about uterine contractions, it is interesting to note that mammary inflation produces contraction of the sub-involuted uterus; this cannot, however, be appreciated in all cases and further observations on the point are required.

While the work of Seitter and that of Widmark and Carlens would appear to support our theory that inflation causes an outpouring of adrenaline, it should be noted that both an increase in blood pressure and an increase in the blood sugar should follow excessive pituitrin secretion.

It is accepted that extracts of the posterior lobe of the pituitary and of the adrenal medulla mutually facilitate each other's action.

From what is known of the action of pituitrin one could understand its proving of benefit in milk fever, but the manner in which its secretion could be induced by inflation of the mammæ is difficult of conception. It is conceivable that there is a connection between mammæ and pituitary through the medium of the uterus with which both are known to have an endocrine relationship, and that inflation of the mammæ, by influencing the production of mammary hormone, may exert some action on pituitary secretion. Nairn (1925),(31) has suggested that the secretion of the mammary hormone is arrested by inflation and that, indirectly, the adrenal-thyroid-ovarian group is stimulated.

While this matter is all highly speculative in character, mention of it here is, I think, justified.

As has been promised, Professor Dryerre and I are engaged upon research into such points in our theory as are capable of demonstration.

It is much to be regretted that unforeseen circumstances have delayed this work, the results of which are still insufficient upon which to base precise conclusions. It may, however, be said that our research is on similar lines to that of Little and Wright, with whose conclusions it appears to be in agreement.

Hypo-glycæmia.—Basing their arguments on the reasonable assumption that during lactation the blood glucose is converted into the lactose of the milk, Widmark and Carlens(32) believe that milk fever represents a hypo-glycæmia. This conversion they say must be pronounced in a heavy milking cow and, as a consequence, a hypo-glycæmia is occasioned during the sudden onset of lactation after calving. They suppose that distension of the udder causes an arrestment of lactose formation and therefore of glucose absorption from the blood, so that a hyperglycæmia develops, but, "as soon as the mechanism of adjustment has begun to work through the appearance of the hyper-glycæmia, the hyper-glycæmia diminishes."

It is difficult to apply this hypothesis to those cases presenting the milk fever complex which occur during late lactation or non-lactation, nor can it be correlated with the occurrence of post-parturient dyspepsia and its cure by inflation. Further, if this theory be correct there seems no reason why milk fever should not occur in practically every heavy milking cow at parturition. Again, the means by which an induced hyper-glycæmia of 90 minutes' duration restores the mechanism of glucose stabilisation in the blood for the remainder of the period of lactation is left unexplained.

While there seem good grounds for accepting the conclusion that mammary inflation occasions an immediate, if short, hyper-glycæmia, it does not follow that upon this effect its curative action depends, nor does the finding necessarily imply that a hypoglycæmia is the determining factor in milk fever. Indeed, as will be shown presently, there is reason to doubt the existence of a hypo-glycæmia during the attack.

Insulin, the product of pancreatic endocrine tissue, when given in overdosage causes a profound hypoglycæmia with symptoms which bear a resemblance to those of milk fever, and in view of this, Widmark and Carlens (1924),(33) and Neefs (1925),(34) advised the use of the intravenous injection of glucose (20 grammes) as a curative measure.

Maguire (1926),(35) found in an estimate of the blood-sugar in five cases of milk fever, that hypo-glycæmia existed and that recovery could be obtained by injecting glucose intravenously. He also found that inflation produced a transient increase in the blood sugar (thus further supporting the findings of Widmark and Carlens).

Maguire believes that milk fever represents an excessive activation of the endocrine tissue of the pancreas, resulting in hypo-glycæmia.

On the other hand, Hayden and Sholl,[36] in a determination of the blood-sugar content in milk fever, obtained results which are, in the main, quite contrary to those of Maguire.

In an examination of forty-four normal cows they fixed an average reading of *51·75* mgms. of sugar per 100 mls. of blood. This figure they considered as probably low. The blood collected from twenty-seven cases of milk fever gave an average reading of *95·82* mgms. per 100 mls. In nine of these cases another sample of blood was taken after recovery (actual time not stated) when an average reading of *72·75* mgms. was obtained.

The averages given are, in themselves, somewhat misleading, as very great variations were found to occur in the sugar content of blood samples collected during the attack—the figures ranging from *35·7* (hypo-glycæmia) to *190·4* (pronounced hyper-glycæmia).

Hayden and Sholl conclude that there is a *hyper-glycæmia* in milk fever and that the high sugar content falls after recovery consequent upon inflation.

It is to be noted that this does not necessarily conflict with the statement of Widmark and Carlens that inflation causes a transient hyper-glycæmia, as Hayden and Sholl took their second sample "after recovery," when presumably the hyper-glycæmia had declined.

Little and Keith (1926),[37] failed to demonstrate hypo-glycæmia in a limited number of cases of milk fever.

It would appear from the available evidence that, while hypo-glycæmia may occur during the attack, the majority of cases of milk fever show a heightened blood sugar content and that, therefore, when hypo-glycæmia does occur it is incidental to the disease. In other words, if a hypo-glycæmia were the determining factor in milk fever, then one should find it present in every case.

It may be noted from the foregoing that the symptoms of milk fever are closely simulated by :—

(1) Guanidin intoxication associated with calcium deficiency.

(2) Insulin overdosage.

That there may be a connection between insulin secretion and guanidin production seems possible, for it has been demonstrated by Secker (1925),[38] that both insulin and guanidin possess similar actions upon the permeability of cells ; while Burns[39] has shown that the production of guanidin is stimulated by insulin.

It is conceivable that the symptoms which follow insulin overdosage do not depend upon the resultant hypo-glycæmia but upon the liberation of guanidin.

Several observers have suggested the possibility of an inter-relation between milk fever and parturient eclampsia of woman.

For some time past I have had the privilege of co-operating with Dr. Francis J. Browne, of Edinburgh, now Professor-elect of Obstetrics in the University of London, in considering the practicability of in-inflating the breasts in parturient eclampsia.

The human mammæ differs from that of the cow in that it is made up of from 15 to 24 lobes. Each lobe consists of several lobules which, in turn, are composed of large masses of acini. Each lobule is provided with a duct which, meeting others, unites to form a single larger canal for each lobe. Each of these lactiferous ducts opens separately at a minute isolated orifice on the surface of the nipple. To effect distension of the breast with air, it follows that each of the lactiferous ducts must be separately inflated through its orifice.

In our early attempts we employed a miniature "teat siphon," similar in form to that used for the cow, but this was soon found to be useless, as we could not obtain a solid-pointed instrument of sufficiently fine calibre to effect our purpose. We then devised a simple cannula corresponding in calibre to a No. 25 hypodermic needle, and it was found that this could be introduced into several of the ducts without injury. By this means partial inflation of the breast has been obtained in two cases of eclampsia, but complete distension has not yet been effected.

While the riddle of milk fever still remains unsolved, we may be encouraged in the realisation that within recent years real progress has been achieved. This has been largely accomplished by the experimental research to which reference has been made in this paper. Baseless theory has given place to reasoned hypothesis which, later, may be put to demonstrable proof.

Our quest is no mean one. The key to the problem may give entry to a new field of knowledge in Comparative Medicine.

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Discussion.

Mr. H. W. Dawes, who opened the discussion, said he had crossed swords with Prof. Greig before, and he had very pleasant recollections of the occasion. In this instance, the professor seemed to have deliberately chosen controversial phases of the problem, but there were not many points in the paper which he (Mr. Dawes) had to criticise. Prof. Greig had taken a very enlightened view of the question of milk fever and associated conditions, which were often remote from parturition or pregnancy. There was a number of conditions analogous to so-called milk fever, and he (the speaker) thought the time had come when their old conception of milk fever as being essentially a disease of the parturient animal would have to go. Most observers who handled large dairy herds were continually dealing with cows which presented the milk fever syndrome or one closely analogous to it, at all periods of lactation up to months after calving, and the very close connection between so-called typical milk fever and grass or stomach staggers, both as regarded symptoms produced and response to treatment, entailed a wide view of the etiology of such conditions.

As to the predisposing causal factors—distribution, age, type of cow, conditions of keep, weather, fatigue, etc.,—some of these were not so important as had been maintained in the past. For instance, with regard to the type of cow, he could not accept the fact of a cow being in high condition as a predisposing cause—large numbers of cows in poor condition developed milk fever. It was a common occurrence for a cow to develop milk fever shortly after calving, make a good recovery, and again, in the course of a month or so, to develop a second attack—so-called "deferred" milk fever. This second attack had no relation at all to the preceding parturition. He had met with cases of staggers during the period of œstrum, and he quite definitely regarded such a period of œstrum as being closely associated with the appearance of an attack. It was, as it were, definitely a dangerous phase for the cow with a tendency towards a milk fever type of syndrome.

If, acting on the views of clinicians, research workers would dismiss the idea of milk fever being necessarily associated with parturition, he thought they would approach the problem of its etiology from the right direction.

Mr. Dawes concluded by congratulating the essayist on the advanced standpoint he had taken up and the excellent exposition of his views.

Mr. Levie said he was delighted to have the opportunity of reading Professor Greig's paper. Milk fever was specially interesting to him as a country practitioner, and he remembered that when he first left college if he pulled 50 per cent. through he thought he was very clever. The treatment then was whiskey, and he had known a cow have three gallons of whiskey in forty-eight hours. He hardly thought all that amount of alcohol could have been good for the organs of the animal. In more recent years, Schmidt's treatment was tried, but though the animal pulled through, it often became useless as a dairy cow. In un-complicated cases, 99 per cent. got better. As to weather conditions, they were told that they only got cases of milk fever in summer, but in the majority of cases milk fever occurred at calving, no matter what time of the year it might be. Summer was the general period of calving, but he did not think the weather played any great part as a causal agent, although he agreed that if a cow had milk fever in July exhaustion might be more pronounced. As to condition, he had seen as acute a form of milk fever in a lean animal as in one in high condition. With regard to recurrence, he would not say an animal might not have it a second year, but he had only seen one animal repeat the attack the following year. He agreed with Professor Greig, that milk fever generally followed easy labour, and he was struck by the fact that he had no record of milk fever after a difficult labour. In Derbyshire, at the moment, he was conducting experiments on the salts which were essential for the animal's pasture, and some important work was being done in that direction. He was dealing with carbonate of lime and chloride of sodium, and if they examined the blood of an animal in these contagious outbreaks of abortion they would find a deficiency of certain salts, notably lime and chloride of sodium. It had occurred to him that they might give these salts in the food, and no case of milk fever had occurred on two farms where the experiment was tried. He gave limestone ground into a powder and Cheshire salt.

Mr. Steele Bodger thought it was a pity they did not have the paper to read a month previously, because it required a lot of study. The paper revealed the greatest movement forward in regard to this problem of any that had yet been published. He should hardly agree that it was wrong to try and divide milk fever cases clinically into different classes, nor did he think there was a general course of symptoms. As frequently as not, he did not find the temperature normal. The temperature was 104° and 105° in most of the cases to which he was called. Last December, he attended a milk fever case with the usual symptoms. It got better, but six weeks afterwards the animal was down again with tremendous excitement and a temperature of 104½°. This coincided with the first period of œstrum. With regard to grass staggers, he had three cases in a week—three, five and six weeks after

calving. Just afterwards, he was called to see a bullock which had just been turned into very good pasture. He took an intravenous needle and pushed it between the shoulder and blew it up. On going back three hours later, he found the animal on its feet. It recovered and was sold in Tamworth auction.

Mr. HOWE said it was his experience also that animals that had had an easy parturition were the most likely to fall victims to milk fever. He thought many cases were aggravated by the condition of the digestive organs.

Mr. ASTON said there was one point on which he desired some enlightenment. Professor Greig had declared that "the typical signs of guanidin poisoning are manifest not only in milk fever but in the nervous complications of post parturient dyspepsia, and in those cases of staggers which respond to inflation." If such was the case, why did not the administering of guanadin produce typical milk fever symptoms? He (Mr. Aston) had been thinking about that one case in a hundred that did not get better, and he had reason to suspect the presence of tubercle bacilli. He always took the temperature and found, in the majority of cases, that it was subnormal. He also regularly inquired what had happened to the placenta. The dangerous cases were generally those that had eaten part of the placenta. He also noted the eye. In the case of a dreamy eye with a definite quivering of the eyelid, the patient usually did well. Animals with a fixed, staring eye did not, in his experience, respond so well to treatment. As to the various causes of milk fever, he had seen a number of cases of apple poisoning which had caused cows to go down with stomach staggers.

Mr. FURNESS referred to a case within his experience in which milk fever symptoms occurred in a pony.

Mr. MAGUIRE, being unable to attend, sent a contribution to the discussion in writing, which was read as follows:—

I wish to congratulate Professor Greig on his very excellent paper, and I am extremely sorry I am unable to be present to participate in the discussion. However, I should like to make a few criticisms in writing. Milk fever is a disease which I have always found most fascinating on account of the anomalies of its symptoms and course, and I have, therefore, paid it special attention. On page 4 Prof. Greig says that a proportion of cases of milk fever recovers spontaneously. Personally, I have never seen such a recovery should the case be one of true milk fever. I have seen cases of *post-partum* paralysis recover spontaneously. I am in entire agreement with the author when he asserts that "parturition is not an essential factor in the production of milk fever in the cow"; but I believe that in all cases where an animal exhibits a syndrome characteristic of milk fever, there is some constant factor which upsets the animal's physiological equilibrium, and which is responsible for the pathological condition exhibited.

I can assure Prof. Greig that cows giving birth to twins do suffer from this disease: I had such a case quite recently. It is an absolute fallacy to presume that cows suckling their calves are rarely attacked with milk fever: it is a common practice in my district for all cows to suckle their calves for at least the first week, yet milk fever is quite a common disease.

I should like to know what is the author's experience of cases of milk fever occurring at the period of œstrum? Personally, I have never seen or heard of a case.

Before discussing the various theories relative to the causation of milk fever, I should like to mention one pathological lesion almost constantly present in cases of milk fever which do not respond to treatment. An autopsy on cases of this kind reveals the liver in a condition of fatty degeneration. This pathological condition, in varying degrees of intensity, may explain the conditions described by Prof. Greig as "Post-partum Dyspepsia," and the condition he ascribes to "dietetic errors." The clinical syndrome in those and fatal cases of milk fever showing fatty degeneration is very similar, the difference being only a degree of intensity.

Regarding Professors Greig and Dryerre's hypotheses as to the nature of milk fever, they seem to forget the fact that guanidin is constantly present to a greater or lesser extent in such a condition as hypoglycæmia brought about by the excessive action of insulin and, furthermore, their hypotheses seem to be disproved by the results obtained from the new intensive method of feeding dairy cows preparatory to calving. I have yet to see a cow fed according to this system go down with milk fever. Further, how do the authors explain the action of the following therapeutic measures in bringing about recovery from this disease?

I. In the injection of very small quantities of pot. iodide solution into the udder, the amount does not in any way cause a distension of the gland.

II. That the intravenous or even subcutaneous injection of glucose will bring about a more rapid recovery than will inflation of the udder.

III. That the subcutaneous injection of pure oxygen or the injection of several synthetic organic preparations also brings about recovery.

All the above agents act presumably by reason of their dehydrator properties and not, as in the case of glucose, by restoring to the blood the glucose it may have lost. These therapeutic measures all uphold my theory that milk fever is a hypoglycæmia and it is further upheld by the work of M. Auger, of the National Veterinary School of Lyons. Prof. Parcher, Principal of this School, very kindly sent me a copy of a communication on milk fever by M. Auger, which was presented before the French Academy of Science. The point of interest in this communication is that Mr. Auger's experiments on milk fever absolutely agree with mine. He also gave *several* healthy cows a large dose of insulin, the result being that in *every* case the animals exhibited typical symptoms of true milk fever, and that by *using the orthodox method of udder inflation* he brought about a prompt recovery to the normal.

Mr. MCLAUCHLAN thought they had been stressing too much the abnormal cases. Ordinary milk fever was the same to-day as it had always been, "and if you keep blowing hard, the patient will get better."

Mr. PRINCE said that the curious thing that struck him about milk fever was that every year it occurred on the same farms. That made him think there must be some association between milk fever and the farm itself. It was his experience that lean cows were just as susceptible to milk fever as fat ones.

Mr. HEATHER thought the treatment of the animal had a good deal to do with milk fever. A cow in the open rarely got milk fever and, if it did, there was generally some secondary cause. He recalled the case of a cow that ate some willow leaves. There were milk fever symptoms and the animal died, but the *post-mortem* showed that the willow leaves were the probable cause of death. He also found that the retention of the placenta was associated with many cases of milk fever. He had a number of herds in his practice that was fed on rations, and farms that used to have milk fever had not had it for two years. The reason for the inflation of the udder had often puzzled him, but as the result was satisfactory he supposed it would continue.

Mr. GUNNING said that in his district one of the biggest obstacles to recovery was tuberculosis. He agreed with Mr. Aston on that point and thought that a *post-mortem* in cases of milk fever that did not recover would show that the animal was suffering from tuberculosis. It was his experience that the temperature in milk fever cases was sub-normal, and cases in which the temperature was high were hard to treat. He thought a saline injection was often beneficial.

Mr. SLIPPER said he thought the only effective remedy was inflation of the udder, and in the majority of cases the animals got up. A danger signal was seen when one passed the catheter and urination was difficult, and the urine almost like coffee grounds. In such cases he seldom got a recovery. When he had made a *post-mortem* examination, he usually found the liver affected, and he wondered whether that had anything to do with the cow not recovering. He was pleased to hear Professor Greig differentiate between milk fever and stomach staggers, and in the latter ailment there was a longer period of convalescence.

Prof. GREIG : Do you find these cases of stomach staggers respond to inflation ?

Mr. SLIPPER : Some do and some do not.

Mr. MCLAUCHLAN : I inflate my cows twice. I do not know whether it is common, but it is my practice.

Mr. DEVILLE said the discussion had been interesting to him, because he had many cases of typical milk fever which responded immediately to treatment, and those which did not respond puzzled him. When the symptoms were the same, why did not all respond to treatment ? He always looked upon high temperature with suspicion, and suspected the presence of something besides milk fever. Another thing that puzzled him was why milk fever did not occur in first and second calvers.

THE REPLY.

Professor GREIG, in replying, said he had gladly accepted the invitation to read a paper on Milk Fever at Derby because he knew he would be coming among practitioners who had a wide experience of the disease and whose contributions to the discussion would be of considerable value. For that reason he had introduced controversial matter in the paper which, while it had provoked an excellent discussion, had been less severely criticised than he had expected.

In advancing the view that parturient milk fever and the other conditions in lactating and dry cows which responded to mammary insufflation were all of the same essential pathology, he was glad to have the support of Mr. Howard Dawes. More records of " milk fever " in non-lactating cows were required. Mr. Dawes' observations upon the association of the milk fever syndrome with œstrum were of great interest, and he believed that the occurrence of this association was becoming more generally recognised. Mr. Dawes believed that " high condition " was not an important causal factor. While " high condition " was generally so regarded, he (the professor) attributed more importance to heavy milking qualities.

Heavy feeding which resulted in surfeit and digestive disorder he also regarded as of importance. Mr. Dawes had asked what was the common causal factor. He believed that a metabolic toxin or group of toxins could be regarded as the common causal factor in all the conditions discussed. It did not follow that this toxin was specific in the sense that a bacterial toxin was specific, but toxic metabolites, of which guanidin might be taken as an example, could be produced under different conditions of metabolic disturbance.

Mr. Levie did not attach much importance to weather conditions. While that might be true, the influence of certain types of weather on the occurrence of the disease was largely accepted. Mr. Levie's observations on the apparent preventive action of calcium carbonate were significant and he would be glad to know the results of further observations on the point.

Mr. Steele Bodger had described a case of a bullock which developed the typical milk fever syndrome and which responded to inflation of the subcutaneous tissue with air. In association with Mr. Lothian of Duns he had recently observed a similar case in a bullock which had exhibited the typical symptom-complex of milk fever. They insufflated the subcutaneous tissues with air, but could obtain no distension ; the air, as it was pumped in, rapidly separated the skin from its underlying tissues. Insufflation was continued for several minutes, when an extensive emphysema resulted. Although the attack had been very severe, the bullock made an uneventful recovery. No conclusion could be drawn from a single case, but, in view of Mr. Bodger's similar experience, the matter seemed to call for mention.

Mr. Deville asked why milk fever was of rare occurrence in first and second calvers. That could not be answered with any certainty, but if one accepted the suggestion that milk fever resulted from dysfunction of the para-thyroids one could believe that these glands would be more active in young than in older animals.

Mr. Maguire asserted that it was an absolute fallacy that cows suckling their calves are less commonly affected ; but this was not the general experience.

The fatty degeneration of the liver which Mr. Maguire had noted in fatal cases of milk fever could not, he believed, be the primary condition upon which the symptoms of post-parturient dyspepsia depended. The response to treatment was so rapid and recovery so complete, that the possibility of the disease depending on serious organic change was precluded.

Mr. Maguire had pointed out that the method of feeding cows prior to calving, whereby bulky, innutritious food was avoided as much as possible, and concentrated, highly nutritious food substituted, appeared to lower the

incidence of milk fever. But this did not disprove their theory, since, if the diet was conducive to proper digestion, the production in the bowel of the toxic products of protein hydrolysis would be minimised.

He had been asked how he explained the action of certain therapeutic measures in bringing about recovery in milk fever.

(1) The mammary injection of solutions of potassium iodide in quantitites so small that mammary distension did not occur.

It would be observed that Schmidt laid emphasis on the importance of distributing the iodide throughout the gland by massage. Potassium iodide, being somewhat irritant, might act mechanically, much in the same way as air distension, in stimulating (directly or indirectly) an adrenaline outflow. Alternatively, iodine might have some specific influence on the endocrine secretions. It was, of course, known to have a specific action on at least one endocrine gland,—the thyroid—and it was conceivable (although perhaps no more than conceivable) that iodine had a specific influence on the production of mammary hormone which, in turn, might stimulate the adrenaline-pituitary mechanism. (As had been indicated, there was at least evidence in support of that suggestion.)

(2) That the intravenous injection of glucose could bring about recovery in milk fever seemed very simply explained on the hypothesis which was enunciated by Professor Dryerre and himself, because

(*a*) the out-pouring of adrenaline caused an immediate increase of glucose in the blood;

(*b*) the injection of glucose relieved the symptoms of guanidin poisoning.

Further, as had been pointed out by Professor Macleod, of Toronto, the symptoms of guanidin poisoning, while resembling those of insulin overdosage, were not entirely dependent upon hypo-glycæmia, for di-methyl-guanidin could cause them without the blood sugar being affected.

The symptoms of guanidin poisoning and those of hypo-glycæmia both resembled those of milk fever, and he would suggest that guanidin could cause the symptoms of milk fever in cows without the blood sugar being affected, for, in their experience, and in that of others, hypo-glycæmia was only occasionally present in milk fever.

(3) The supposed value of subcutaneous injections of oxygen and air in milk fever could be explained by assuming that these procedures produced sympathetic stimulation. It was a mere assumption but, in the present state of knowledge, it was the only one which could be regarded as reasonable. Mr. Maguire stated that "several synthetic organic preparations" when injected subcutaneously also produced recovery. This was important information, but Mr. Maguire had omitted to mention the nature of these several preparations.

Mr. Maguire claimed that the experiment of M. Auger as reported in the *Comptes Rendus de l' Académie des Sciences* (1st Feb., 1926, No. 5) upheld the theory that milk fever was essentially a hypo-glycæmia.

According to Mr. Maguire, Auger injected "several healthy cows with large doses of insulin, the result being that in every case the animals exhibited typical symptoms of true milk fever and that by using the orthodox method of udder inflation he brought about prompt recovery to the normal."

Had Mr. Maguire read Auger's communication in the original French? If so, then either Mr. Maguire or he had mistranslated it.

According to his (the professor's) translation, Auger injected, not several cows, but one cow, with a heavy dose of insulin. One hour after injection the cow became drowsy and refused to get up; the symptoms increased in intensity, and attained their maximum between the third and fourth hour, when the symptoms appeared to have been similar to the comatose stage of milk fever. Mammary inflation was not practised, but, instead, 40 grammes of glucose were injected subcutaneously ("*nous avons substitué au tamponnement de la mamelle par l'air une injection sous-cutanee de* 40 *g. de glucose en solution.*") and the symptoms disappeared in five minutes.

This experiment was, in itself, without significance and was one which was practised on small animals in the laboratory almost daily.

He would readily admit that the comatose symptoms of milk fever could be nicely explained if one assumed that a hypo-glycæmia existed, but his difficulty lay in assuming a hypo-glycæmia when experiment had shown that it did not exist in a large number of cases of milk fever. Indeed, some milk fever cases, during deep coma, gave a blood sugar reading indicating marked hyper-glycæmia.

In conclusion, he would like to remind them that the theory of Professor Dryerre and himself was merely a working hypothesis. They did not claim that it was right. They had put it up as a mark at which workers could shy the brickbats of their experimental research; for it was only by the test of the experimental method that the strength or weakness of that theory could be shown.

The Cairo Museum will shortly be enriched, according to the Cairo correspondent of *The Times*, by an interesting addition as the result of a discovery made by Messrs. Firth and Quibell, who are excavating on behalf of the Egyptian Department of Antiquities at the Sakkara step pyramid. While clearing a space for a dump at the edge of the Third Dynasty plateau they came on a large gable-topped case which when opened was found to contain the mummy of a horse.

The horse, which is over 16 hands, is in perfect condition, and has now been set up by Dr. Douglas Derry, Professor of Anatomy at the Kasr el Aini Hospital, and is being prepared for exhibition. The remains of another horse were found near the first, but these had not been mummified and were imperfect.

From the style of the case, the strata where it was found, as well as the character of contiguous human burials, the dates of these discoveries are estimated at about 1200 B.C., but as the case bears no inscription it is impossible to be more precise. As far as is known, horses were first introduced into Egypt by the Hyksos, or Shepherd Kings, and there are many representations of them on monuments of the XVIII Dynasty. The interest in this find lies in the fact that it is the first mummified horse to have been found and the earliest known specimen in Ancient Egypt.

Messrs. Entwistles Ltd., who recently amalgamated with the old-established firm of Wright & Co. (Liverpool) Ltd., inform us that they are exhibiting their well-known Specialities in Dog Foods at the forthcoming Royal Lancashire Show, to be held at Burnley, on July 29th, 30th, 31st and August 2nd, and cordially invite all friends, both old and new, to visit their Stand (No. 160) during the Show.

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LIST OF SUCCESSFUL CANDIDATES.

LONDON.

Class A.

Chalmers, G. S. R.
†Edwards, G. V. J.
Evans, T. M.
Everett, K. H.
†Filgate, T. A. R.
Hirtes, R. E.
†Longley, E. O.
Loveless, S. F.
*Machin, R.
Marshall, K. I.
†Polding, J. B.
Rowlands, W. T.
Stevens, W. A. S.

Class B.

Bhattacharjee, J.
Bovett, L. W.
†Bragg, A. L.
Coulden, L. W.
Evans, J. T. R.
Formston, C.
†MacIntyre, A. B.
Over, A. B.
Purchase, H. S.
Sadler, H. J.
Sheriffs, J. T.
Shin, M. B.
†Stevenson, J. S.
Steward, J. S.
Wilkinson, D. E.
†Wright, A. J.

Class C.

Barron, N. S.
†Claxton, B. A.
Cooper, W. J.
Danby, D. C. E.
Downing, W.
†Edwards, S. J.
Gabriel, L.
†Messervy, E.
†Orr, A. B.
†Roberts, R.
Shah, S. I. A.
Shoshan, A.
†White, J. B.
†Woodrow, C. E.

Class D.

Aldis, D. H.
Cairns, G.

LONDON—*contd.*

Davies, D. J.
Dixon, A. C.
Dowling, R. E. C.
Ismail, M. M.
†Jordan, L.
Stewart, J.
Wood, C. R.

EDINBURGH.

Class A.

†Anderson, J.
Buchanan, A. S. W.
Erskine, D.
Forgrave, W.
Gibson, G.
†Horne, W. H.
Leiper, T. W. M.
Macdonald, N.
*McChlery, A. S.
*McKinna, J. B.
Massey, R. T. H.
Mather, A.
†Newton, H. W.
Prentice, A. S.
*Reid, J.
†Speed, J. G.
Stewart, C. A.
†Urquhart, A. M.

Class B.

†Blount, W. P.
Harcourt, K. W.
Harvey, C.
Kennedy, D.
†Malaga Alba, A.
Paley, R. W.
Ratter, A.
Simpson, S.

Class C.

Aston, F. W.
Bain, Hugh.
Burgess, J. W.
Curmine, J. M.
Edwards, J. T.
†Holmes, J. W. H.
Hume, A. C.
Johnson, G.
Kennedy, A. J.
Kyle, R. S.
Lauder, J.
†Mackay, W. M.

* denotes 1st Class Honours.
† denotes 2nd Class Honours.

EDINBURGH—*contd.*

†Moore, R.
Watson, A. S.
Willett, R. A.
†Wilsdon, A. J.

Class D.

Adamson, J. S.
Brook, G. B.
†Burrow, H.
Danks, W. B. C.
Davidson, R. M.
Elliott, G. F.
Emslie, J. W.
Fisher, P.
Heather, E. J.
Heveningham, A. G.
Mullen, A. L. F.
Ralston, A. G.
Scott, C. S.
Walker, J. P.
Welsh, W. C.
Wilson, D. R.
Wilson, J. E.

LIVERPOOL.

Class A.

†Fuad, E. S.
Hammond, R. A.
†Heeley, E.
*Mohammed, Z.
Shingler, H. C.

Class B.

Curtis, H.

Class C.

Blakemore, F.
Macdonald, J.
†Radford, W. J.
Thomas, G. H.

Class D.

Durrant, G.
Higgins, R. L.
†Roberts, Miss I. L.

* denotes 1st Class Honours.
† denotes 2nd Class Honours.

(To be continued.)

Dublin Horse Show.

RECORD ENTRIES FOR NEXT MONTH.

Visitors to our Dublin Congress will read with interest the following note from *The Times* of July 14th. :

"The Dublin Horse Show, which will begin this year on August 3rd, is likely to surpass all previous 'records.' The entries, which total 930, are greater by 14 than those of last year, which were the largest in the history of the Royal Dublin Society, and it is expected that the attendance during the four days of the show will tax the increased accommodation of the Ballsbridge show grounds to the limit of their capacity. Already all the available seats on the grand stand in the jumping enclosure have been booked.

"The introduction of an international military jumping tournament has proved to be a great attraction. Entries have been received from England, France, Belgium, Switzerland, and the Netherlands, as well as from the Free State Army. Every team will have three horses, and the attendance at the competition, which will be held on the third day of the show, probably will be the largest that ever has been present at Ballsbridge. The entries for the bloodstock sales number more than 800, showing a marked improvement on the entries of former years. These sales have been increasing steadily since the war. In 1922 they amounted to £20,000, in 1923 they had increased to £34,000, in 1924 they reached £66,000, and last year they touched the 'record' figure of £100,000."

A Pig Flies.

Messrs. Chivers and Sons have exported a large white boar, bred by Mr. C. E. Cross, of Ely, to France, by aeroplane.—*The Times.*

CLINICAL AND CASE REPORTS.

An Experience of the Uncertain Action of Aloes given in Ball Form.

By Capt. O. V. Gunning, M.R.C.V.S., Tutbury.

In February last I received a call from my bedroom window to attend a mare suffering from colic. On my arrival, about 1 a.m., the mare, of light vanner type, showed no alarming symptoms. The pulse was good, the visible mucous membranes were only slightly injected and peristalsis was audible over both the large and the small bowel. I considered the case one of subacute impaction and that the obstruction was probably moving. Help was scarce : I therefore administered a physic ball and gave a hypodermic injection of arecoline. It was the kind of case that I expected to find better in the morning.

On the following morning I was prevented from seeing the mare until 11 o'clock when, contrary to my expectations, I found the case had become protracted. The habitus of the mare was generally worse. I therefore passed the tube and slowly injected into the stomach two bucketsful of saline solution—about five gallons.

On withdrawing the tube, I noticed something adhering to the extreme end. A closer examination revealed that, without doubt, this was a portion of the physic ball given upon my first visit some ten hours previously ; in fact, it appeared as if the tube had gone directly into the bolus. It was evident that little or no dissolution had taken place.

This fully bears out the statement made by Reeks on page 97 of *Common Colics of the Horse.* Discussing aloes, he states : " I have already pointed out that there is very little movement of the bowels in this form of colic (subacute obstructive colic); consequently, the drug may remain almost stationary in the stomach or at least gain the first few feet of the small intestine." It would also appear to explain the annoying cases of superpurgation which occasionally occur forty-eight hours and even longer after a dose of physic has been given. It at least convinces the writer that Reeks is right, and that aloes, at any rate in ball form, must not be relied upon when treating cases of impaction.

It may be suggested that the quantity of fluid pumped into the stomach would have washed the aloes off the tube. However, I found the aloes stuck with such tenacity that no amount of washing, but only scraping, would remove it. It may further be suggested that the bolus had lodged in the lower part of the œsophagus. While not denying this possibility, the fact that the owner gave the mare a drench during the night, and that there were no symptoms of choke, would seem to negative this view.

It was not until the mare had recovered that it came to light that she had broken loose and gained access to a bin containing barley meal.

Lipoma in a Cockatoo.

By Capt. H. Kirk, M.R.C.V.S., Wigmore Street, W.

To those who do not often treat parrots, the following case may be of some interest. Twelve months ago I was asked to give an opinion as to what should be done with a bird that was afflicted with a large growth on its right leg. At that time the new tissue was the size of a large tangerine. I counselled that, as the parrot was not inconvenienced in any way, it would be wise to let ' well ' alone, and interfere only if the condition became irksome. A week ago I was again sent for and found that the tumour had attained the size of an orange, had extended up the back for some distance, had encircled the leg and reached the cloaca. Its surface was studded with large vesicular elevations which occasionally ruptured externally, then emitting some amount of blood. Others had apparently ruptured internally, the blood coagulating inside and giving the blisters the appearance of areas of gangrene. The ulcerated surface of the growth was causing the bird to pick at it, in addition to which difficulty was obviously experienced in climbing about the cage, and the patient preferred to sit quite still. The owner had reached the sympathetic stage and, if nothing could be done, would prefer to have the bird " put to sleep." As that was contemplated, the suggestion of a surgical operation and its attendant risk was facilitated. The lesion appeared to me quite inoperable and I was careful to point out that, should this prove to be the case upon closer examination, it might be necessary to administer an overdose of chloroform. The thirty-year-old cockatoo eventually arrived at the surgery accompanied by six big tin boxes containing nuts, biscuits, home-made cake, oranges, bananas, apples, brown bread, seeds, sand, and a miscellaneous collection of toys such as date boxes, cotton reels, wooden rods, etc. Professor Wooldridge very kindly gave me his opinion of the case, and thought I should have no difficulty.

To anæsthetise the bird, its cage was closely covered with a blanket, leaving provision for access to the door. Chloroform vapour was pumped in by means of Hobday's apparatus, and at the end of forty-five minutes three drams had been used, besides two drams of chloroform on cotton wool placed on the top bars. The bird, however, was still conscious, although drowsy. I then placed three drams of chloroform in a small cup, which floated on hot water. In ten minutes this had evaporated, and the bird fell to the floor of its cage, still retaining the standing position. At the end of fifty-five minutes, it was unconscious, and was removed to the operating table, where its two legs were included in a tape hobble, and its head placed in the mask of Hobday's apparatus. Vapour was slowly administered, and breathing was regular. After removing many feathers and cleaning up the site of the proposed incision, a commencement was made, and I was surprised to find how well the tumour could be dissected out. On account of the thin, perforated, and otherwise diseased condition of the skin, however, it was found necessary to remove a

far greater quantity than was compatible with neat or effective suturing. The greater part of the cut edges was, nevertheless, brought together and all seemed well.

At this stage, unfortunately, respiration suddenly ceased, and ten minutes of artificial respiration and restoratives failed to save the bird's life. It was a miserable termination to an otherwise neat and promising operation, and I am wondering now whether there was a flaw in my technique or whether the collapse was due to some existing organic disease over which I had little or no control. Although 1 oz. of chloroform was used, plenty of air was given with it, which probably accounts for the length of time required to bring about anæsthesia. The lipoma was weighed and just touched 8 ozs., whilst in bulk it was too large to go into a one-pound jam pot.

Fatty Necrosis in a Jersey Cow.

By J. F. D. Tutt, M.R.C.V.S., Winchester.

Subject: Jersey cow.

History: This cow had an attack of milk fever last year, and had another attack on May 28th of this year. She got over this all right, but in ten days developed acute mastitis involving three of the quarters. This was proving amenable to treatment, but on June 26th, after being brought in and tied up for milking, she died within half an hour.

Post-mortem: My assistant took blood smears to exclude the possibility of anthrax, which proved negative, and made a *post-mortem* at the local knackery the following day. He found multiple growths which he regarded as lipomata, involving the pericardium, omentum, and mesentery. Not being satisfied, he sent a few up to Sir John M'Fadyean, who has kindly reported that they are not lipomata, but products of the rarely-occurring fatty necrosis, supposed to be due to the escape of the fat-splitting enzyme from the pancreas, arising from pancreatic disturbances. The references to the condition in our text books are practically *nil*, but Kinsley (*Veterinary Pathology*, p. 259) states: "This is a condition characterised by the conversion of fat into fatty acid and glycerine, that is, saponification of fat. The name fatty necrosis is a misnomer, as the condition is not necrosis. It should be called saponification of fat; in fact, a fully developed fat cell represents that amount of stored, available food, and there is in reality no vitality in the cell, and necrosis in dead tissue is not conceivable. Again, the real existing condition is saponification of the fat, not necrosis. The probable cause of fatty necrosis is resorption of steapsin induced by pancreatic disturbances, although steapsin may be absorbed from the intestine. Some four or five cases have been observed in the dog, several in the sheep, and one horse was examined that was affected. In each of these cases there was evidence of pancreatic lesions, and inflammation, hæmorrhage and atrophy were noted in one case." Unfortunately in this case, the pancreas was not examined.

ABSTRACTS.

["Poisoning of Cattle after eating Reed Grass contaminated with putrid pieces of fish." H. Haupt and A. Runke, *Zeitschr. f. Veterinarkunde, Jhr.* 38, 1926. 50.].

The entire live stock of a mill in Saxony, consisting of seven cows, and two calves, was given an evening feed of toppings, oat straw, hay, turnips and decorticated cocoanut cake and, in addition, a small armful of reed grass. Within half an hour, symptoms of poisoning of such severity occurred that four cows had to be killed: the remaining animals recovered.

The symptoms were apathy, sub-normal temperature (36.7°-37.3° C.), very rapid, small and jerky pulse, suppressed peristalsis and cold ears. *Post-mortem* examination showed hæmorrhagic inflammation of the stomach and intestines and engorgement of blood in all organs. The cause of the trouble was traced to the reed grass, examination of which showed it to be contaminated with putrid remains of fish, left by the overflowing of a pond which drained into the meadow from which the reed grass was cut. Owing to abnormal conditions, the fish had not been removed by birds, as was usually the case, but had been left there and had subsequently decomposed. Trimethylamin was obtained on boiling potash lye from both the putrid fish remains and from the stomach contents of the dead animals.

D. K.

Protozoal Enteritis of the Dog and Cat.

Little is known regarding the pathogenic rôle played by the Giardia parasites of the cat and dog. It is possible, but by no means certain, that the species parasitising these animals are distinct both from each other and from parasites of the same genus in other animals and in man. Statistics regarding the frequence of occurrence are not available. Existing knowledge would appear to indicate that in animals the parasites are not responsible for the severe enteritis caused in man, and carriers in apparent perfect health are not uncommonly met with.

Amœbic dysentery occurs both in dogs and cats, but more rarely in the latter species, and in these animals the disease closely resembles the corresponding condition in man. It appears to be not improbable that the amœbæ of man and the carnivora are identical, but medical opinion at the present time is that human beings contract the infection from others of their race and not from the lower animals. Spirochœtal infections occur in dogs and cats, and the view has received some support that parasites of this genus are responsible for gastro-enteritis (Stuttgart disease) in dogs.

[Sur quelques "Enterites a Protozoaires" du chien et du chat. (Protozoal Enteritis of the Dog and Cat.) M. A. Martin. *Rev. Vét.* 1926. January. Vol. 78. No. 1. pp. 5-18. *Ex Trop. Vet. Bull.* Vol. 14, No. 2.].

ROYAL COLLEGE OF VETERINARY SURGEONS.

Annual Dinner.

MINISTER OF AGRICULTURE ON THE FOOT-AND-MOUTH DISEASE CAMPAIGN.

The Rt.-Hon. W. E. Guinness, D.S.O., M.P., Minister of Agriculture, was the principal guest at the Annual Dinner of the Royal College of Veterinary Surgeons, which was held at the Hotel Victoria, Northumberland Avenue, London, on Wednesday, June 30th, 1926, when the Minister made an important pronouncement as to the success which was attending the efforts made to stamp out foot-and-mouth disease in this country, with special reference to the beneficial results of the imposition of the Carcasses Order.

The following is the list of diners :—

Bradford, Sir John Rose, K.C.M.G., C.B., C.B.E., M.D., D.Sc., F.R.C.P., F.R.S., Bulloch, Wm., M.D., LL.D., F.R.S., Floud, Sir Francis, K.C.B., Fortune, R., Grant, Ross, Guinness, Rt.-Hon. Walter, D.S.O., M.P., Jones, Adrian, M.V.O., M.R.C.V.S., Langford, E. W., J.P., Magnus, Sir Philip, Bart., F.C.P., Power, Sir D'Arcy, K.B.E., M.A., M.D., F.R.C.S., Richelet, Dr. J., Rogers, Sir L., M.D., F.R.C.P., F.R.C.S., Thatcher, R. V., Thomson, Sir St. Clair, Watt, A. H., President, National Federation of Meat Traders, Abson, J., D.S.O., T.D., F.R.C.V.S., Andrews, W. H., D.Sc., M.R.C.V.S., Atkinson, G., M.R.C.V.S., Banks, R. Mitchell, K.C., M.P., Barton, F. T., M.R.C.V.S., Bannatyne, T., M.R.C.V.S., D.V.S.M., Batt, A. E., M.R.C.V.S., Batt, T. G., M.R.C.V.S., Berry, C. E. W., Bilson, F. E., Bishop, J. H., Boyle, V., M.R.C.V.S., Brittlebank, J. W., C.M.G., M.R.C.V.S., D.V.S.M., Bryden, R., F.R.C.V.S., Buxton, J. B., M.A., F.R.C.V.S., D.V.H., Bullen, R. E. C., M.R.C.V.S., Cabot, D. A. E., M.R.C.V.S., Carter, J. H., F.R.C.V.S., F.R.S.E., Clarkson, J., M.R.C.V.S., Coleman, J. C., M.R.C.V.S., Craig, J. F., M.A., M.R.C.V.S., Dunkin, G. W., M.R.C.V.S., D.V.H., Evans, J. T., Farrow, A. Hastings, Fear, H., Fox, H. P., D.V.Sc., M.R.C.V.S., Fox, J., M.C., M.R.C.V.S., Gaiger, S. H., F.R.C.V.S., Glover, Dr. W., Gostling, A. E., M.R.C.V.S., Green, F., Gray, Henry, M.R.C.V.S., Hancock, W. A., M.R.C.V.S., Hatton, W. J., M.R.C.V.S., Hobday, F. T. G., C.M.G., F.R.C.V.S., F.R.S.E., Hughes, R., F.R.C.V.S., Hurst, W. A., Jackson, J. J. R., M.R.C.V.S., Kane, J., M.E., J.P., Kelland, P. J. L., M.R.C.V.S., King, W. S., M.R.C.V.S., Kirk, W. H., M.R.C.V.S., Lepper, H. G., J.P., M.R.C.V.S., Livesey, G. H., M.R.C.V.S., and son, Lloyd, E. C., M.R.C.V.S., Locke, G. H., M.R.C.V.S., Martin, G. Dunlop, M.R.C.V.S., Male, G. P., M.R.C.V.S., Matthews, G. T., M.R.C.V.S., McIntosh, J. W., M.R.C.V.S., F.R.S.E., Moore, Dr. Irwin, Moore, Sir John, K.C.M.G., C.B., F.R.C.V.S., Morton, W. S. E., M.R.C.V.S., Munro, A. M., M.R.C.V.S., Murgatroyd, Major H. C., Murgatroyd, Captain C. S., Nicks, E., Parkin, H. J., M.R.C.V.S., Penberthy, J., F.R.C.V.S., Perryman, W., M.R.C.V.S., Power, Commander D'Arcy, M.B., F.R.C.S., R.A.F., Raw, Nathan, M.D., Rees, W. D., M.R.C.V.S., Reid, H. A., O.B.E., F.R.C.V.S., F.R.S.E., D.V.H., Rennie, T., M.R.C.V.S., Ridley, E., Robinson, R. H. O., F.R.C.S., Rowlands, R., Roberts, C., M.R.C.V.S., Sawyer, H. T., C.B., D.S.O., M.R.C.V.S., Scott, E. E., M.R.C.V.S., Sheather, A. L., D.Sc., M.R.C.V.S., Simpson, P. J., D.S.O., T.D., F.R.C.V.S., Slocock, S. H., F.R.C.V.S., Smith, A. Croxton, Smythe, A. R., M.R.C.V.S., D.V.S.M., Spencer, T. F., M.R.C.V.S., Stevens, J., M.R.C.V.S., Sumner, H., M.R.C.V.S., Thomson, F. G., M.D., Tindall, B., Tipper, L. C., M.R.C.V.S., Trangmar, E. W., Tuck, R. W., Wall, R. F., M.R.C.V.S., Watt, Wm., M.R.C.V.S., Walker, G. K., C.I.E., O.B.E., V.D., F.R.C.V.S., West, E. Alfred, F.R.C.V.S., West, D., Willett, F. W., M.R.C.V.S., Willett, J., M.R.C.V.S., Young, T. D., O.B.E., M.R.C.V.S., D.V.S.M., and Bullock, F., Secretary.

Following the honouring of the loyal toasts—with added warmth as including the health of the Royal Hon. Associate, H.R.H. the Prince of Wales—

Lieut.-Colonel J. W. BRITTLEBANK, C.M.G., M.C.R.V.S., D.V.S.M., submitted the toast of "Agriculture" in the following terms :—The toast that I have to give you is one which I need scarcely say affords me a tremendous amount of pleasure—"the toast of Agriculture." The honour of proposing a toast like this is one I have been waiting for for a good many years. I have proposed, I think, every toast except that of Agriculture. I got fairly proficient at most of the others, but the subject I love most I know least about, or rather the longer I live amongst it the less I am compelled to think that I know. At any rate, I believe we may say here that we are part and parcel of agriculture as a profession. The whole of our sympathies are with agriculture, and our Royal College has a distinct responsibility in turning out well-equipped veterinary surgeons to serve agriculture and to conserve the stocks in this country. We, I know, are quite accustomed to hearing the Jeremiahs who are continually telling us that agriculture is beyond redemption. I do not believe anything of the sort. (Hear, hear.) We have in this country—and we shall have, so long as the conditions exist which have existed for so many years—the finest flocks and herds that the world knows, and there is no reason to suppose that British agriculture is not going to remain the spring from which refreshment is found for the flocks and herds of the world. (Cheers.) We are told, for instance, that other countries, such as Denmark and Germany, produce more per 100 acres than we do—that Germany produces double the amount per 100 acres than we do in the British Isles. What the British Isles has got to remember, and the producer in this country has got to contend with, is this everlasting cry for cheap food, which is the most prominent political cry throughout all generations. It has placed agriculture under a tremendous disability. I believe that if agriculture were to be scientifically treated in a way which would allow it to develop its own resources to the utmost possible extent it would soon show that it would produce food just as cheaply

and just as well as those neighbouring countries which flood us with their products.

You will permit me, Mr. President and gentlemen, to congratulate the Minister on the very prompt and energetic steps he took to deal with the most recent outbreaks of foot-and-mouth disease. (Cheers.) We believe that one of the largest sources of the introduction of infection into this country has been discovered, and we hope this will have a marked effect on the periodic outbreaks of the disease with which we have been so long troubled. There is no doubt that this country is passing through a bad time in consequence of these outbreaks; the breeder of pedigree stock is experiencing enormous difficulties. The Ministry is, I feel sure, pursuing the right path in encouraging research throughout the country. Considerable assistance is now being given in every possible direction, and we hope that in time to come many of the problems which are still causing great loss to the flocks and herds of this country will be elucidated, and we shall be able still further to relieve the herd and flock masters from the disabilities under which they are suffering to-day. I would make particular reference to the fact that there is an enormous field for investigation into the diseases of sheep.

It is, I think, quite evident that the veterinary profession is trying to do all it can to fulfil towards agriculture the function for which it was established. We of the profession are looking towards agriculture to assist us, and I think the more agriculture can assist the veterinary profession the greater the benefit she will reap from us in the years to come. (Cheers.)

The toast having been heartily honoured, The Rt.-Hon. WALTER E. GUINNESS, D.S.O., M.P., Minister of Agriculture and Fisheries, rose amid hearty cheering to reply. The Minister said: It is a real pleasure to be the guest of the Royal College of Veterinary Surgeons this evening, and I should like to thank Colonel Brittlebank for all the things that he has said about agriculture and its importance. He is in a more fortunate position than I am: he says that among his after-dinner speeches it is rarely that he has to deal with agriculture. With me it is different—I have to deal with agriculture more nights in the week than I like to remember, and therefore to-night I think it is probably better that I should avoid the more general aspects upon which Colonel Brittlebank has touched, and deal rather with the side of agriculture which affects the veterinary profession.

I am particularly glad to be allowed to respond to this toast, because I have long admired the efficiency of the veterinary profession, and I have come to the conclusion that perhaps one of the reasons for this efficiency is that, unlike the doctors, the members of your profession can choose the moment for the *post-mortem* on their patients, whereas the doctor has to wait for Fate or the peculiarities of his patient to give him his opportunity. (Laughter.) There is no doubt that agriculture owes an enormous debt to the veterinary profession. Live-stock is now by far the most important side of British farming, and your profession protects the farmer from the ravages of disease by curative and preventive measures, and by research into the causation and control of epidemics which enables the farmer sometimes to turn loss into profit.

To-night, both the Ministry of Agriculture and the veterinary profession mourn the loss of three great public servants. Sir Thomas Elliot was the first permanent secretary to the Minister of Agriculture. He held that office for 21 years and guided the footsteps of eight of my predecessors. He had much to do with animal diseases, and I believe he was largely responsible for stamping out pleuro-pneumonia.

Sir William Leishman has been chairman of our Foot-and-Mouth Disease Research Committee; he has been invaluable in the ability and energy with which he took up the investigation from which we are still hoping for great results in the control of this scourge.

Among his own people it is not necessary for me to point out what a terrible loss we have all suffered in the death of Sir Stewart Stockman. Sir Stewart had a very great gift for research; he, I think, wore himself out and brought about his early death by not sparing himself in this fight against foot-and-mouth disease. He took up also that great subject of sheep diseases, to which Colonel Brittlebank has referred, and carried out most brilliant investigations into scrapie and louping-ill. He has done much for the export of our pedigree stock by the methods he perfected of immunising cattle against malaria, and it was chiefly, I think I may say, due to him that efficient measures have been taken against contagious abortion. The veterinary profession, no doubt, realise his attainments in research. What I realise, perhaps more than most people, is what a great administrator we have lost. Sir Stewart Stockman practically built up our Animals Department at the Ministry of Agriculture. (Cheers.) Agriculturists in the country have a good deal in the way of criticism to say of the political gentlemen who follow each other at the Ministry of Agriculture, but they never have anything but praise for the Animals Department and those veterinary inspectors with whom they are brought into contact. (Hear, hear.) The public generally, perhaps, do not realise how much these veterinary inspectors have done from the point of view of lessening animal suffering, of improving the conditions under which animals travel, of ensuring that only horses in good condition are allowed to be exported, and generally ensuring that every possible means is taken to see that ocean transport is as safe and comfortable as possible for our live-stock.

The efforts of Sir Stewart Stockman and the Animals Department to deal with foot-and-mouth disease have obtained very valuable evidence as to their efficiency and wisdom in the support which they have had from the National Farmers' Union; without that support I am quite confident that we should not have kept foot-and-mouth disease under, and I am sure that if our inspectors had not been very very

wise in their administration we should not have got the farming interest on our side in this difficult task in the way we have. It is very unfortunate that Sir Stewart Stockman was not able to review in greater detail the result of his enquiries in the Argentine, and still more that he has not been able to follow up the information thereby obtained.

I regret very much the inconveniences which we have had to impose upon the public in the Carcasses Order, but before we lost Sir Stewart Stockman, he told me, in some detail, of the arrangements in the Argentine. He assured me that the authorities there were doing all in their power to prevent the possibility of infected carcasses being exported to this country, and I have now strong evidence that there is a great distinction between the conditions of export from the Argentine and the conditions which obtain in those countries, far more heavily infected with foot-and-mouth disease, to which we apply the embargo.

I had no doubt in my mind that as soon as we had definite proof, from this Carluke outbreak, that foot-and-mouth disease had actually been caused by infected fresh meat from the Continent, the only possible course was an absolute embargo. Measures such as Stand-still Orders were obviously inapplicable to countries such as Holland, where you had over 30,000 outbreaks in the course of a single year; if a Stand-still Order had been effectively applied it would have meant the complete paralysis of the whole of their agriculture, and it is quite evident to you, I am sure, that no system of inspection either at the abattoir abroad or at the ports in this country could have protected us against the danger of carcasses being sent here which had not developed the lesions—which were merely in the incubative stage. I think we are going to be subjected to a great deal of pressure to relax this Order; it is very unpopular in certain quarters. One of my predecessors, Lord Long, used to tell the story of one of his colleagues in the Conservative Government, saying, "You may be able to stamp out rabies, but in doing so I think you will also stamp out the Conservative Party." (Laughter.) If there was so much antagonism to the Dog Muzzling Order as to justify such a fear as that, what must it be when we cut right across great trade interests, and when our action can easily be translated into terms of prices which affect the meat supply of the working classes?

I am not going to prophesy as to the future course of foot-and-mouth disease. I certainly do not imagine that we have found the only cause of the primary outbreaks which are our chief problem in this country, but I do think that we have probably found one very important cause. It is remarkable that in the last month we have had only six outbreaks—not primary outbreaks, but outbreaks of any kind—and that is less than we have had since September of last year. The fact that we have found one source of infection certainly does not justify us in relaxing our efforts to stamp out the disease when it shows itself; in fact, I think it will depend upon our success in that direction whether we get the backing of public opinion in relieving this country of the danger of infection by means of fresh meat from Europe. We have on our side in this fight a very efficient staff of veterinary inspectors at the Ministry of Agriculture who, in the last five years, have obtained great experience of foot-and-mouth disease, and who have naturally developed very efficient means for its control, but the real burden of our measures against foot-and-mouth disease must rest upon the ordinary veterinary practitioner. The inspectors employed by the Ministry are the staff behind the lines, but the first-line trenches, upon which we depend, are held by the country "vet." (Cheers.) Unless he recognises foot-and-mouth disease in the very earliest stages we are necessarily involved in very costly expedients to stamp it out, and the very efficiency of our modern methods has made it difficult for the veterinary practitioner to recognise foot-and-mouth disease because many of them, I am glad to say, have never seen it.

I fully appreciate the great responsibility and the terrible risk of unpopularity which rests upon them owing to their duty of notifying us not only when they are satisfied that there is a case of foot-and-mouth disease, but where they merely have suspicions. I cannot imagine any more appalling position than that of the veterinary inspector to a local authority in having to hold up a market because he thinks that there may be a case of foot-and-mouth disease. (Hear, hear.) We have probably all heard of instances where these suspicions, quite rightly formed, have proved unfounded and where the inspectors of the local authorities have been left in a very difficult position by their perfectly proper and courageous action. We do realise their difficulties and I can assure any of them who are here to-night that if it is ever in our power to help them and to back them up in their difficult duties we shall not be behind hand in doing so. (Cheers.)

We have got to obtain public support for our policy of excluding the possibility of infected carcasses getting into the country, and so far I think the public has accepted the Order with great willingness. But undoubtedly there is a great agitation being got up in certain quarters and it is necessary that we should justify the Order, that we should do everything we can on our side to lessen its inconvenience and that we should educate the public as to its necessity. I do not think it is generally realised that human beings can get foot-and-mouth disease. One of our veterinary staff contracted the disease in the course of his duties, and from the details of his case it would appear that the scourge, when it attacks human beings, is a very much more serious matter than when it attacks animals. I read last week in the papers that there have been four cases of foot-and-mouth disease amongst human beings in Denmark, and I think on this ground alone—quite apart from the interest of the farmer, which must, of course, be our chief concern at the Ministry of Agriculture—there is complete justification for the most stringent measures to deal with this serious disease. (Cheers.)

We have, in the last year, opened a campaign against another scourge of our British live-stock. We have passed a measure and issued an Order to deal with bovine tuberculosis. There is no doubt that in this country we consume much less raw milk than we should do. (Hear, hear.) Per head of the population we drink 20 gallons per annum, whereas in the United States of America they consume 54 gallons per head, and in Sweden 68 gallons. I do not think it is merely that imported condensed milk is cheaper; I think it is also explained by the fact that the public have a certain suspicion of the purity of fresh milk, and there is very strong evidence—circulated to the whole population—that children can contract tuberculosis from milk given by cows in an advanced stage of the disease. For that reason, I think we have acted in the interests of agriculture, quite apart from the interests of the health of the community, in issuing the Order to deal with cattle which are active disseminators of tuberculosis. If we can increase the confidence of the public in fresh milk and bring about a greater demand, it will mean very much to the British farmer; it will mean a pleasant possibility of profit from an increased demand, and I believe that if they remove this suspicion and reproach from our British live-stock the veterinary profession will once more have deserved the gratitude of the agricultural industry which they have served so well in so many directions in the past. (Loud cheers.)

Mr. E. W. Langford (President of the National Farmers' Union), submitting the toast of the Royal College of Veterinary Surgeons, said: I can assure you that it affords me very great pleasure to propose so important a toast as that of the Royal College of Veterinary Surgeons, but I wish to be very brief after the excellent speeches you have heard from Colonel Brittlebank and from the Minister of Agriculture. But I do want to say this, that we as agriculturists do owe a deep debt of gratitude to your profession. Yours is a very old institution, much older than the National Farmers' Union; you were 60 years of age before we were born. The functions of your Royal College are very important and you have very great responsibilities. You have to indicate to the colleges the curriculum through which your large number of students have to wend their way, and you have to be responsible for the examinations they have to pass before the letters M.R.C.V.S. can be added to their names and they are permitted to practise. Your work is educational. The National Farmers' Union came into existence to foster and guard the economic side of the agricultural industry. But you have to do much more than that. It has been thought that the farmers have been in the past foes to research work and opposed to the assistance that science could give the farmer, but if you wanted a proof of the anxiety of farmers to assist you in your endeavours, you could not find a stronger one than that when the Act of Parliament was repealed—the Agriculture Act of 1920—the National Farmers' Union stipulated that in lieu of the four years' notice that should have been given to the farmers the Government should set aside one million pounds for research work. (Cheers.)

We have listened to a very thoughtful and encouraging speech from the Minister this evening. He has indicated to you his willingness, with your assistance, to do anything and everything to stamp out the terrible disease of foot-and-mouth. He has indicated that in certain circumstances it is possible for human beings to contract the disease. What a lamentable thing it would be if at the present juncture Mr. Cook, the miners' leader, should get infected with the disease. (Laughter.) I am perfectly certain that, in addition to the medical profession, you of the veterinary profession would rally round and do all you could professionally to pull him through. You would probably stamp out the disease: I am not sure whether, in your anxiety to stamp it out quickly, you would not stamp out life: I am not sure whether, following your early policy of stamping out that disease, you would not resort to slaughter. (Laughter.)

You have under your supervision and authority five important colleges. I did not know that the farming community had a great prejudice against the college at Camden Town. I suppose that they thought that the students there would have nothing to practise upon but cats and dogs. But three or four years ago I was a member of a party which was invited to look round that institution when I, for my part, was quickly reassured. I am perfectly certain of this, that, as agriculturists, we owe a very deep debt of gratitude to the veterinary profession in this country. I am myself a breeder of pedigree stock, and I want to say that I do not wait for disease to break out on the farm before I call in the veterinary surgeon. I think that when we farmers wish to be successful as breeders, we had better take the advice of your profession frequently in regard to the health of our stock. Within the last few years I have been fairly successful in the show ring, and I think that is largely due to the fact that we have frequently called in the veterinary surgeon and that we make use of his help and advice to the utmost possible extent. (Hear, hear.) It is very important that when the veterinary surgeon comes on to the farm he should not "put up the backs" of the farm labourers; it is very rarely that they do it, but occasionally they do. If you are going to pull animals through serious diseases you cannot do it unless you enlist the assistance and enthusiasm of the stock-man, who has the nursing of them. The Minister has indicated his willingness, in fact, his eagerness, to do anything and everything from the Veterinary Department of the Ministry to help you carry out your duties. I would like to emphasise one point which he made, and that is this; that the moment you go upon a farm and see a suspicious case that that case should be reported and regarded, until it is proved to the contrary, as being one of foot-and-mouth disease, so that there cannot be any fear of a spread of that disease.

The Minister has indicated something of the great loss which the veterinary profession has sustained

in the deaths of the three gentlemen he mentioned. The one with whom we came most closely in touch was Sir Stewart Stockman. It was, indeed, his great devotion to public duty and his anxiety to stamp out foot-and-mouth disease, with the immense amount of work imposed upon him in consequence of it, that hastened his death. That is the real public spirit—not to consider yourself, but to put your very best into your work. (Hear, hear.) I am happy to say that we believe that we have got, in his successor, one who will be as untiring in his efforts and who will be as devoted to the cause Sir Stewart Stockman had at heart, that of helping the agriculturalists of this country. (Cheers.)

I cannot sit down without making some reply to the Minister's remarks in regard to milk. I agree with him that it is lamentable that per head of the population we consume so little milk, but in quoting figures it is sometimes overlooked that we consume infinitely more cheese than those countries with a higher milk consumption. Many of you have travelled to the United States of America, and you will bear me out when I say that you rarely see cheese put upon the table. I want to make that point, because probably we do consume as much in the way of milk products as is consumed in the United States, but for the child-life of this country it would be infinitely better if we consumed more milk. I am going to suggest how you can help the consumption of wholesome raw milk in this country and that is by seeing that some steps are taken so that people can have a greater knowledge of what they are taking when they consume condensed milk. There is an enormous quantity of skimmed condensed milk imported into this country from countries which prohibit the sale of it within their own borders. You have no safeguard for the population of this country against the dangers attendant upon the unsatisfactory conditions under which a good deal of the imported milk is produced, and I submit that if regulations safeguarding the health of the people are enacted in the matter of the production of milk, you ought to see to it that the milk imported into this country is produced under the most rigorous conditions in the country of its origin.

Concerning tuberculosis, I want to remind your profession that a reacting cow does not necessarily produce tuberculous milk; I believe that less than one per cent. has the germ of tuberculosis in it. So that, in the main, our milk is as safe for human consumption as that produced in any country in the world. I believe that there has been an immense improvement in the production of milk on the farms of this country, but I feel that there is a good deal that might be done in encouraging it and, so far as the farming community is concerned, we want, whenever there is inspection, to be under the veterinary surgeon rather than under the medical officer. (Cheers.) We believe that it is a veterinary surgeon's job to attend to animals; we believe that under the Orders that are about to be imposed by the Ministry of Health, in co-operation, of course, with the Ministry of Agriculture, instead of the medical officer of health having so much to do with these matters, we would rather see them operated by the man who knows most about them—the veterinary inspector. (Hear, hear.) Perhaps the farmer is interested to a less extent, but he is very largely interested in the cutting down of carcasses in our abattoirs, and we believe also that here the public would be better served and the farmer would be better satisfied if his animal was cut down under the authority of the veterinary inspector rather than under that of the sanitary inspector. (Cheers.)

We look to the veterinary officer to help us out of many of the difficulties that seem to confront us at the present moment. It is a matter of great importance to us that our flocks and herds should be kept free from disease; it is of greater moment to us that those diseases about which you, who know so much, know so little at the present time, should receive yet fuller investigation, and that for these you should, in your enthusiasm, find remedies and preventive measures, so that in future we shall be able to export our stock in larger quantities, and that with those animals that we do not export we shall suffer fewer losses. The National Farmers' Union is out to help your profession in every possible way. In our Year Book, on the first page, we indicate to farmers where they can get help, and what you are doing for them scientifically. When you have made discoveries in your research stations we try to bring them to the notice of the working farmer, so that he can make the greatest possible use of them in his own interest. We thank you for what you have done, and we look forward with confidence to what you are going to do. (Cheers.)

THE PRESIDENT OF THE ROYAL COLLEGE OF VETERINARY SURGEONS (Mr. J. Clarkson, M.R.C.V.S.), on rising to reply to the enthusiastically-honoured toast, was received with loud cheers. The President said: I thank you first for the enthusiastic way in which you have drunk this toast, and Mr. Langford also for the extremely kind things which he has said about my profession, the interests of which I have so closely at heart, which I love so much and which I have lived long enough to see undergo a greater measure of improvement than any other. The improvement which has taken place in my profession since I first knew it is incalculable. There is no doubt that the College has had a very long and strenuous struggle, and I am glad to have lived long enough to see it coming into its own and being recognised at last as able to perform the functions which are right and proper to it.

We have, during my year of office, established a few "records." The first is that your President was called upon to lay the Foundation Stone of the Institute of Animal Pathology which has been established at Cambridge. (Cheers.) Another record is that we have adopted academic dress which, to judge from the various reports received from different parts of the country, is an extremely popular move. (Hear, hear.) Another one is that of the occurrence of a General Strike, and this one, I hope, will stand for

all time. There is yet another "record" in that there is not a single case of the absence of a member who promised to come. That is, indeed, most gratifying. (Hear, hear.)

With regard to the training given by the Royal College, I am well within the mark in saying that there is no more complete course given in any country in the world than is our own M.R.C.V.S. course, while the D.V.S.M. is absolutely the hall-mark for the public health work of the veterinary profession. The D.V.S.M. is an extremely strenuous course (I speak from experience as a supervisor), and the man who holds it is fit for any post which the Public Health Service has to offer the veterinarian. Reference to public health leads one, naturally, to the newly-introduced Tuberculosis Order. I am quite confident, in my own mind, that the money spent on a very thorough inspection of the cattle in this country will be saved at the other end—the sanatorium; and by eliminating the enormous amount of suffering which now exists in consequence of the ravages of consumption, which can be attributed to the bovine type of bacillus. There is an old saying "What is fit is fine," and I cannot imagine anything fitter or finer than veterinarians being in charge of animals and animal products. (Hear, hear.) That is in agreement with what my friend, Mr. Langford, has said. Might I take you for a moment into the future; when every member of the profession is enthusiastic, when the two great benevolent societies in the profession are amalgamated; when we have one big amalgamation scheme; when it becomes the fashion for the rich men in the profession, if there are any (laughter), to grant bequests to the College. A lot of very good work could be done provided we had more money. Another thing I should like to see in the near future would be that every editorial office in the kingdom had a copy of the Register, and that strict orders should be given by the editors, that before any paragraph was inserted in the paper, referring to a man as a veterinary surgeon, his qualification must be verified by reference to the Register (hear, hear), because it does not follow that a man who has seen a horse is a veterinary surgeon. I will not detain you longer, for I see several research workers round the table, and I do not want them to go away and announce the discovery of a new parasite, the *Boreus clarksoni*. (Laughter.)

Major F. T. G. Hobday, C.M.G., F.R.C.V.S., F.R.S.E., who gave the toast of "Medicine," said: The toast which I have the honour to propose is that of the sister branch of the medical profession, and by that I understand the *human* patient side, whose work is indissolubly connected with the *animal* patient side, and has, with almost every great discovery which has been made, passed through a veterinary aspect before the surmised value of the discovery could be applied to man. The ancient god Chiron, the Centaur, is the outstanding figure in the crest of the Royal College of Veterinary Surgeons, and takes an equally prominent place in the heraldry of the Royal Society of Medicine, and you have been told to-night by Mr. Langford one of the chief differences, in that our patients cannot talk and therefore tell us nothing, at any rate we have the negative evidence that they tell us no lies. He, too, referred to the mystic letters M.R.C.V.S., which was too long for him to finish. It is supposed to mean Member of the Royal College of Veterinary Surgeons, but I have heard it translated as Merciless Rogue Characterised to Victimise the Simple. (Laughter.)

From start to finish, the human and animal branches of medicine run side by side, and the members of the medical and veterinary professions are working more than ever together in the present day for the solution of the problems of disease.

We of the veterinary branch have had much for which to thank our medical *confrères* in the past, as there was once a time when it was difficult for financial and other reasons for us to stand alone, and in those days there were graduates of human medicine who were wise in their forethought in that they helped to put the scientific study of the diseases of animals on a proper footing. (Hear, hear.) On the Continent veterinary science has received Government assistance to an extent which is undreamed of in this country, but it is only of recent years that it has been properly recognised in Great Britain that, although medicine as a whole is one science, it has many outstanding differences to be thought of when comparing its application to man and animals respectively.

In fact, we of the veterinary profession go further and will make the statement that the treatment of the respective varieties of animal is so different, owing to their peculiar anatomical and other arrangements, that it is necessary for us to divide ourselves up into branches of special study, and ourselves respectively to become specialists.

In providing help for us in this direction, the Royal Society of Medicine, whose popular and distinguished President, Sir St. Clair Thomson, is with us to-night, has set an example which is proving of very great advantage in bringing together on common ground, in its branch of Comparative Medicine, medical men and veterinarians.

It is an advantage, the sequel of which will be felt in the years that are to come to a much greater extent than at the present moment, and already it has made a perceptible difference between the scientific and social relationship of the two. At its meetings attention is particularly drawn to the diseases which have their analogy, or their communicable qualities, or their differences, in relation to man and animals; and it is astonishing, when one goes into this question, how very much the two are allied. Their effects, however, are not always symmetrical, for the symptomatic reaction is scarcely ever the same on the animal as on the man; and not only this, but there are generally differences in the symptoms shown by a disease on the respective variety of the animal patient it attacks.

Much time can be gained by the study of these diseases if we fraternise more and come out of our watertight compartments; and it is not any boast on

our part to say that there are quite a number of ailments for the prevention of which in man the veterinarian is absolutely indispensable. Take, for example, such serious diseases as tuberculosis, glanders, rabies, and anthrax, all of which are fatal, whether attacking the man or the animal. With two of them, glanders and rabies, it rests entirely with the veterinarian to see that he does his part properly, as, if he acts according to modern ideas, it is possible for him to help his medical *confrère* to such an extent that these two horrible diseases become non-existent in man. Great Britain can be quoted as the ideal example of a country of which the people are kept so entirely free from the fear of these two diseases that the medical student of the present day who wishes to see instances of them, either in man or animals, is forced to leave our shores. Rabies has now been non-existent here for many years, and glanders, too, may now also be said to have taken its departure. Anthrax and tuberculosis are equally definite as problems which have to be solved by the collaboration of human and veterinary medicine. Could it be made possible to provide for the efficient sterilisation of all hides, hair, fertilisers, bone manures and other animal products coming into Great Britain from countries where anthrax is known to be prevalent, it is reasonable to assume that anthrax in man would be effectually blotted out.

Tuberculosis, upon which so much thought and money is expended annually, is so communicable as you know, from the cow to man, that more than 10,000 children die annually of tuberculosis of proved bovine origin, and is a disease which is typical of the necessity for the collaboration of the two professions, not because, as the Hon. Walter Guinness has told you, that America consumes some 54 gallons a head to our 20 gallons, as that may be due (perhaps) to other causes—Prohibition not forgotten amongst other reasons in that teetotal country. One of our distinguished medical guests this evening, Colonel Nathan Raw, is the President of the Tuberculosis Society of Great Britain, and has devoted many years of his life to the study of this subject, and at the present moment a very interesting series of observations is being made on the vaccination of calves as a means of rendering them immune, and thus building up tubercle-free herds, instead of merely destroying all those which prove to be infected.

Members of the medical profession are always welcome visitors at our veterinary dinners, and we are pleased to see this evening such a distinguished crowd. (Cheers.) I am asked to couple with my toast the names of Sir John Rose Bradford and Dr. Frederick Thomson, whose names are so well known, not only in their branch of the profession, but in ours too, that it is scarcely necessary to do more than mention them.

Sir John Rose Bradford has so much the confidence of his colleagues that at the present moment he occupies one of the highest positions possible to attain, namely that of President of the Royal College of Physicians. In addition to degrees in medicine, he is Fellow of the Royal Society, whose members in their turn had such a high opinion of his qualities that they elected him to act as their Secretary from 1908 to 1915. During the war he was appointed Consulting Physician to the British Expeditionary Force, and retired with the rank of Major-General. Previously he had been Senior Medical Adviser to the Colonial Office, and as a further testimony to the high esteem in which he is held and also to his business qualities, it is worth noting that he is the present President of the London and County Medical Protection Society, whose duties are similar to those of our own Veterinary Defence and Mutual Provident Society, to defend the practitioner who has been wise and foreseeing enough to join it, against litigation and unjust accusation. The remarks made by Sir John at a recent meeting of this Society might well be taken to heart by those of our profession who have not yet considered the question, and apparently they are of equal importance to the medical branch as they are to us in the veterinary. He says: "One was to impress upon all members involved in any dispute of any kind not to take any action on their own account before communicating with the Society. Numerous difficulties encountered would be avoided if members would place such matters in the Society's hands from the earliest possible moment, without taking legal action of any kind themselves." I may inform him that a mutual protection society is as necessary against cantankerous clients in the veterinary profession as it is in the medical, although I read with envy in the *British Medical Journal* that the funds of the society available for legal expenses seldom came much below £38,000 or £39,000.

Dr. Frederick Thomson's honour, as showing the esteem in which he is held amongst his brethren, is that of President of the British Medical Association, an association which numbers approximately some 26,000 members, and is probably the most powerful influence for the dissemination of knowledge and for social good-fellowship in the medical profession. Dr. Thomson's year of office will be a full one, for nominally, at any rate, he is responsible for the success of that great Annual Congress which takes place in some large town of England every year.

The British Medical Association has a membership which we of the veterinary profession can look at with envy, when we compare it with the smaller membership of its prototype our National Veterinary Medical Association. I am sure that I shall be expressing the wish of everybody present to-night when I say that we wish our guest, Dr. Thomson, a very successful year of office. (Cheers.)

Others of the profession of medicine who are our invited guests this evening include Sir D'Arcy Power, Sir Leonard Rogers, Professor Bulloch, and a distinguished member of the medical branch of the Air Force, Squadron-Leader D'Arcy Power, who volunteered, while still a student, for medical service in the Bulgarian war, for which he was awarded the Montenegrian war medal, and who gained the Military Cross in the recent European struggle. His father,

Sir D'Arcy, is probably the best known liaison officer between the two professions; for he is as well-known to us from student days, having been a teacher in the Royal Veterinary College, as he is to his colleagues in the medical world. He has occupied the Vice-President's Chair of the Royal College of Surgeons, and has been President of the Medical Society of London, of the Harveian, and of the Section of History of Medicine of the Royal Society of Medicine. He is a frequent guest at our veterinary functions, and his presence is always more than welcome.

Sir Leonard Rogers, whose name is a household word in medical circles, particularly in the East, is acclaimed by the profession as one of its highest authorities on certain Eastern diseases. He is no friend to the mosquito, or the biting fly. The work which he has done on cholera and dysentery, and more recently that which he has applied to the treatment of leprosy, has made his name one of the most talked of in all the countries of the world. Not only has he done great work in the past, but since his retirement from the Indian Medical Service as a member of the Medical Board of the India Office, and as Physician and Lecturer of the London School of Tropical Medicine, he is unselfishly disseminating the knowledge which he has gained for the benefit of his colleagues, and the good of mankind.

Professor Bulloch, too, is almost as well known as Sir D'Arcy Power; but his presence before the student was in the capacity of Examiner and not of Teacher—none the less welcome, for I have heard numerous encomiums on his fairness and the kind manner which he has always evinced even when plucking the poor unfortunate victim. As bacteriologist to the London Hospital, and a Fellow of the Royal Society, as President of the Pathological Section of and honorary Librarian to the Royal Society of Medicine, and late Examiner to the Universities of London, Leeds and Liverpool, not forgetting the Royal College of Veterinary Surgeons, we feel that we have an old and distinguished friend in our midst to-night. (Cheers.)

To Sir St. Clair Thomson, left until last but by no means least, I have already made allusion. His qualities are so many sided that he seems to be equally at home in the ballroom, and even in a French railway accident, as in the Presidential chair, and I am not saying anything invidious when I assert that he is one of the best and most popular Presidents the Royal Society of Medicine has ever had.

Gentlemen, the toast is "The Medical Profession," and I am asked to couple with it the names of Sir John Rose Bradford and Dr. Frederick Thomson. (Cheers.)

Sir JOHN ROSE BRADFORD, K.C.M.G., C.B., C.B.E., M,D., D.Sc., F.R.C.P., F.R.S., President of the Royal College of Physicians, who was the first to reply to the toast, said: It is a serious duty to have to reply to the toast of Medicine in an assembly such as this. Whatever difficulty I might have in responding to this toast is further increased by the fact that—I do not know why—all this evening I have had before my mind a certain dinner party which I attended at the outset of my career as a physician. I remember I was the only young man there and I sat next to a certain well known and distinguished surgeon (all surgeons, I believe, are distinguished, and all physicians, I believe, are eminent)—(laughter)—and this distinguished surgeon amused himself at my expense by saying that he was very glad to have the opportunity of sitting next to a physician, because he imagined that they were a disappearing race and he would be able to tell his grandchildren that he had once sat next to a physician at dinner. When I look back something like 30 or 40 years to that dinner party, I cannot help thinking how mistaken the surgeon in question was, because, however great the progress of surgery—and of course it has been very great during those years—the progress of medicine has also been great. The surgeon who spoke to me thought that the physician was a disappearing quantity owing to the advances of surgery, but perhaps, after all, the surgeon was right and the physician is a disappearing quantity, not for the reason that he then advanced, but rather for the reason that, with the progress of knowledge, the number of diseases has so greatly diminished. I remember quite distinctly, in the last few years of my teaching at one of the medical schools in London, that one had considerable difficulty in getting clinical material to exemplify diseases that were relatively common when I was a student. The preventive side of medicine has increased to a very wonderful degree, and one cannot help thinking that there is perhaps scarcely any limit to the extent to which it may increase.

In an assembly such as this one naturally turns to the connection between our branch of medicine and your branch of medicine. After all, medicine, whether it be human medicine or animal medicine, is but a branch of natural history, and we have heard this evening, in some of the speeches, how exceedingly difficult it is to draw a hard and fast line between our kind of medicine and your kind of medicine. If you look at the science of human medicine and the science of veterinary medicine, you will see that you have an enormous advantage over us in one respect, as follows: if we confine ourselves to human medicine absolutely, the progress of our science, as distinguished from our art, is almost entirely a matter of observation; the field of experimentation to us in human medicine is extraordinarily limited, whereas with you the field of experimentation is enormous and, as Harvey pointed out and as others have pointed out from Harvey's time to the present time, science advances very slowly if it is a matter merely of observation, but it advances by leaps and bounds if it becomes a matter of experiment. Surely you have an immense advantage over us in that respect and, as previous speakers have indicated, there are numberless instances in human medicine where the great progress achieved has been largely due to the study, and the experimental study, of animal disease. It is true that these things cannot be transferred directly, but the prin-

ciples can be transferred and I think that we cannot draw the bonds too close between human and animal medicine. When you consider that an animal at the Zoo died of what in human pathology would be spoken of as gin-drinker's liver, that is a fact which is of immense importance to us, who have to deal with human pathology, as showing how very mischievous it is to have a narrow basis for one's theories as regards the causation of disease. When I think of the enormous advance which might be made, and which doubtless will be made, by the scientific study of animal pathology in all its branches, I cannot help thinking, as a physician, of the benefit which will ultimately accrue to human medicine from researches of that kind. I thank you, Sir, for asking me here to-night, and we thank you, gentlemen, for the kind and appreciative manner in which you have received the toast of human medicine. (Cheers.)

Dr. F. G. THOMSON (President of the British Medical Association), who also replied, said: Though it is a very great honour to be asked to reply to this toast, I must confess that you have made it extremely difficult for me in asking me to follow such an eloquent speaker and, shall I say prominent, physician (laughter) as Sir John Rose Bradford. The College of Physicians may be said to represent the élite of the medical profession; I have the honour of representing the much more democratic Association which comprises some 30,000 members. (Hear, hear.)

The study of disease must present the same essential problems, the same essential difficulties, whether it occurs in animals or man, and our two professions must always touch all along the line. (Cheers.) As an example of this, I might perhaps be allowed to refer to the fact that I, even I, in my young unregenerate days, performed operations on animals when I strayed from the paths of medicine into those of surgery. One of the most successful operations I ever performed was to set a canary's leg, and I can assure you it was a somewhat difficult operation. (Laughter.) Stress has been laid upon one of the disabilities under which you, as veterinary surgeons, labour—that your patients cannot speak. I think the advantage is with you. (Laughter.) Another advantage which you undoubtedly have over, us is that if a patient is not doing well you probably shoot it; of course, we are not allowed to do that, at least, not at present. (Laughter.) One advantage we have, however, is that while our patients do occasionally kick at what we propose to do for them, thank Heaven they do not bite. (Laughter.)

I wish to thank you all, in support of the words of the President of the Royal College of Physicians, and say how much we appreciate the great compliment you have paid us in offering us your hospitality here to-night. (Cheers.)

Lieut.-Colonel T. DUNLOP YOUNG, O.B.E., M.R.C.V.S., D.V.S.M., submitted the toast of "Our Guests" in the following terms:—

I rise to propose a toast which will be acceptable to you all; it is that of "Our Guests." When I received the letter asking me to perform this pleasant duty I recalled from my memory a story which I heard on the wireless not long ago. It was told by an American lady about a countryman of her own who, visiting the sights of London, asked a young lad on the street the nearest way to St. Paul's Cathedral. After a slight hesitation the lad, who happened to be a stutterer, directed him to go to the top of the street and he would find the Cathedral on his left. The American proceeded on his way, but had only gone a few steps when he was called back. He retraced his steps and asked "Well, my lad?" After another hesitation the lad said, "There are eight million people in London: why the devil did you pick on me?" (Laughter.) Like the lad, I wondered why I had been picked, because there are many members of our profession who could have done more justice to the toast than I can hope to do. However, I knew that the request came from the chairman of the Dinner Committee, Sir John Moore, whom I had the honour and pleasure to serve for a long time and, I obey. I am placed in a difficulty because when listening to Major Hobday proposing "Medicine," I was not sure whether he was really proposing "Medicine" or "Our Guests," or a combination of the two.

Gentlemen, I feel sure you will agree that it is good for us to meet once a year to renew old acquaintanceships and to form new ones, to talk over the joys and sorrows of the past year, also our hopes and ambitions for the future. The pleasure of doing so is increased when we have with us as guests many good friends belonging to other professions. Friendship is one of the greatest gifts we possess and it is like good wine, the older it is the more we value it. Amongst our guests the names of many eminent members of the medical profession appear on the list handed to me. I proposed to say something about them but, as Major Hobday has already given you a "who's who" history of them, I content myself by saying, on your behalf, that we welcome them here. We hope they will enjoy themselves and come again. Turning to the other names, we have Professor Buxton, President of the National Veterinary Medical Association, who needs no introduction to you. Mr. Langford, of the National Farmers' Union, whose fine speech shows the type of progressive farmer, and one who does not wait for trouble and then try to cure it, but adopts prevention by consulting his veterinary adviser. We have Mr. Bilson, of the Pharmaceutical Society; Sir P. Magnus, of the College of Preceptors; and Mr. Watt, of the National Federation of Meat Traders, whom we welcome for the first time. He represents a body which recognises our profession as one closely connected with the meat trade in assisting the farmer to produce healthy animals, also as the proper persons to examine carcasses of animals intended for human food. I have always found meat traders anxious for inspection, but they insist, and rightly so, that those who inspect must know their job. To proceed, there are with us the Right Hon. W. E. Guinness, D.S.O., M.P., Minister of Agriculture, and Sir Francis Floud. The former has given us a speech which is full of encouragement

both to the farmer and to us. It is with pleasure we see with us to-night Captain Adrian Jones, M.V.O., one of us whose name as a sculptor is known all over the world; long may he be spared to visit our Annual Dinner. (Hear, hear.) Mr. Fortune and Mr. Thatcher, our good legal advisers, are here; they watch that we keep out of legal troubles or, if we do get into trouble, help us out. Dr. Tuck, of the U.S.A. Veterinary Service. Captain Grant, of the Australian Veterinary Service; and Dr. Richelet, of the Argentine Veterinary Service we are pleased to have with us. They are good samples of the progress our profession makes in other lands and the type of officer produced. I cannot allow this occasion to pass without paying a tribute to one who is with us to-night, though not as a guest. I refer to Mr. Jackson, who is to fill the position lately occupied by our lamented Sir Stewart Stockman. I have known Mr. Jackson for over 25 years, and no one is better fitted to fill the difficult position of Chief Veterinary Inspector to the Ministry of Agriculture than he. We all wish him health, happiness and prosperity in his new official capacity. (Cheers.) Lastly, but by no means least, we have the representatives of the Press, whom we specially welcome. They criticise us at times, but that is good for us; it shows us our weaknesses and stimulates us to greater progress, and when we do good work they kindly let the world know. Gentlemen, I wish you to fill your glasses, rise and drink the toast of "Our Guests," and in doing so I want you to drink it not formally, but with all sincerity, in a way the great Scottish poet used to do when he said:—

"Here's a hand my trusty freen,
And gies a hand o' thine.
May we meet again another nicht,
For days o' Auld lang syne."

I couple with the toast the names of Professor Bulloch and Mr. A. H. Watt.

Gentlemen, the toast is "Our Guests."

Professor W. BULLOCH, M.D., LL.D., F.R.S., replying, said: Two speeches have been taken from me to-night, first by Mr. Hobday and then Mr. Young. I do not know why I should have been chosen to be the scapegoat. I cannot think but that there are a great many more distinguished people here, some of whom I count as personal friends. Apparently it is because I was once an examiner—but it cost me more to provide my colleagues with liquid refreshment than I earned—which is very hard on a Scotsman. (Laughter.) Another reason is perhaps that I am a member of the Foot-and-Mouth Research Committee, and on that I will just say one thing. The Foot-and-Mouth Research Committee has made very considerable progress. Although the actual virus eludes our grasp, and no doubt belongs to a group not discovered yet, I can say—as indicative of the remarkable work done by the Ministry's Laboratory and at the Lister Institute—that much light has been thrown on the manner in which the disease can be propagated. It is found that the virus can last a very much longer period than anyone dreamed of outside the body. That throws open a great many avenues as to the manner in which it can enter this country. We are on the eve of getting some very considerable additions to our knowledge of the subject. The work has been gone into in a thoroughly businesslike way at the Ministry's laboratory. To me, the death of Sir Stewart Stockman was a very serious personal loss. There is no member of the Committee who does not feel that he put his very best into the work. (Hear, hear.) I feel personally a great regard for Stockman and everything I saw of him was entirely to his credit. I saw him the night before he went to the Argentine and he did not appear to me to be at all well. His sudden end is a shock to all of us.

Another important thing is the attitude of the present Minister. I do not think sufficient has been said of the Hon. Mr. Guinness. I have known him for a number of years as a member of the Governors of the Lister Institute. His father, Lord Iveagh, was the most generous endower of Medical Research this country has ever seen. He gave the enormous sum of a quarter of a million pounds to the Lister Institute, and the work could not have been done were it not for that extraordinarily generous gift. (Cheers.) Before Mr. Guinness came to the Ministry of Agriculture he was at the Lister Institute. He brought a sane mind and a wide outlook. Although I am usually "agin the gov'ment," I feel we have in him a mind endowed with splendid qualities which will enable him to fill that onerous post in a most creditable manner. (Hear, hear.) In regard to the question of milk and tuberculosis, it was said that one country drank 50 gallons and another 60 and another 120 gallons. One country not referred to is Japan. Milk is not an article of diet in Japan. Kitto Sato found that the indigenous cattle are not tuberculous, that the amount consumed per head is 28 drops per day—less than 2 c.c. (Laughter.) The medical statistics of Japan show that, with the exception of lupus, every form of tuberculosis is as common in Japan as it is here. I do not wish to enter into any discussion of tuberculosis, but a great deal too much has been made of bovine tuberculosis. I was asked as a student to inspect a carcass of a very fine prize bullock worth £250, condemned by the medical officer of health. I found a nodule, but I told the M.O.H. that I did not think the carcass should be condemned—at that time they condemned everything. I am in entire sympathy with what has been said about the veterinary profession, and I feel I am here among personal friends. I thank you, in the name of the many distinguished people I see around me. (Cheers.)

A. H. WATT, Esq. (President, National Federation of Meat Traders' Associations): I am glad to be allowed to say a few words, as President of the National Federation of Meat Traders' Associations, in response to this toast. We have 300 associations affiliated to us. We have a membership of between 20,000 and 30,000—so that we are a body of some little importance. We are very pleased with the fact that the relationship between your profession and the meat trade has become very close. We welcome the co-operation of the veterinary surgeon in the work

of the meat trade. We welcome such gentlemen as Mr. Dunlop Young, Mr. Trotter, and Mr. Dixon, of the City of Leeds. These three gentlemen have an intimate knowledge of the meat trade, and I think it is mostly on that account that I am here to-night. It is a common fact that motors have displaced horses to some degree, but I do not know of any mechanical means of producing meat. Therefore, in the opinion of the meat trade, your profession and ours must come much closer. I should like to speak of meat inspection from the butcher's point of view. You all know the manner of granting meat inspector's certificates. A man who goes three years into the building trade, or puts 300 hours in the Public Health Department, can then sit for a meat inspector's certificate. He can serve two months in a slaughter establishment and acquires a sufficient knowledge of the thirty-three diseases scheduled for condemnation! The reason that I am here to-night is this: we say that in the meat trade we have abundant and the best material for lay meat inspectors. We have men who know meat, and men who, with a little training, would make exceptionally good meat inspectors under the supervision of a veterinary inspector. (Hear, hear.) We believe in the uniformity of meat inspection. We do not think it is right that meat passed in one district should be condemned in another. We believe that while the Sanitary Institute is doing good and useful work, the knowledge that they give to those who qualify for meat inspectors is not sufficient, and we look forward to the time when the profession and the meat trade will co-operate and let us have a great system of uniform meat inspection for the whole country. (Hear, hear.) It is a crying shame that in many places there is no veterinary inspection. We are not against inspection. We welcome it—even the most stringent inspection, but we do think that the decision should be in capable hands. On behalf of the meat trade I thank you for your kind hospitality to-night. We know that in your profession you have a great power and ability. Your diplomas are sought after. We do ask you to use them in helping us to a reliable system of meat inspection. (Cheers.)

The PRESIDENT: I have a further toast to propose. It is not in the list, but it concerns one who is very intimately associated with the profession. I mean our Secretary, Mr. Bullock, who, though not a veterinary surgeon, is the most enthusiastic veterinarian I know. (Cheers.)

The toast was at once drunk with great enthusiasm and the singing of "For he's a jolly good fellow," after which there were cries of "speech." Mr. Bullock, who was received with much cheering, said:—

Mr. President and Gentlemen, I thank you for this very unexpected honour. At this very late hour I have but a few minutes in which to express to you my gratitude. I have been reflecting this evening that it is now 20 years that I have had the privilege, and the honour, of serving the Royal College, and I am deeply touched at the very cordial, and I think I may say affectionate, way (cheers) in which you have received this toast. Someone called me yesterday a "briefless barrister." Mr. President and Gentlemen, that is not a true description of me. I have a brief in my bag which is my constant study and which I am very proud to hold. It is endorsed, thanks to your bounty, with a good, round sum. It is the brief of the Royal College of Veterinary Surgeons *versus* Quemcunque et Quoscunque. (Cheers.) I can assure you that so long as I enjoy your confidence, and so long as health and strength remain to me, it will be my greatest pleasure to continue to devote to the service of the veterinary profession, without stint and with my whole heart, whatever little ability I may possess. (Loud cheers.)

The toast of "The President" was then proposed simultaneously from several parts of the room, and was drunk with musical honours.

Mr. CLARKSON, who met with a great reception, said:—Gentlemen, I am afraid I have unintentionally brought this on myself, but I do thank you all for your reception of this toast. I am very pleased to think that my year of office has had such a successful finish.

The enjoyment of the evening was enhanced by the talent of Mr. Victor Marmont at the piano, while the catering was of the high standard associated with the Hotel Victoria.

FARMER FINED £20 FOR IMPEDING INSPECTOR.

Walter Fox, of Holme Farm, Richmond, near Sheffield, was summoned at Sheffield for committing a breach of the Diseases of Animals Act of 1925, by not isolating a cow owned by him, suffering from a chronic cough and showing signs of tuberculosis. He was also summoned on a number of similar counts, including one of impeding a veterinary officer in his examination.

Mr. William Tweed, a veterinary officer, said that he visited the defendant's farm on 14th May. While he was examining the premises he heard Fox drive an animal out of a shed. Fox at first denied moving an animal, but later admitted that he had turned a cow into the fields.

Witness found that the cow was in a very emaciated condition and was suffering from tuberculosis.

The magistrates said that they considered the charge of impeding the veterinary officer the most serious and fined Fox £20 in that case. He was fined 25s. on each of four other charges.—*Sheffield Mail.*

Liverpool School of Veterinary Science.

B.V.Sc. EXAMINATION RESULTS.

FINAL EXAMINATION—*Part I.* Durrant, G., Parasitology, with distinction; Roberts, Ida L., Parasitology, with distinction.

Part II. Mills, D. W.

THIRD EXAMINATION—*Parts I, II and III.* Macdonald, J.

FIRST EXAMINATION—*Part II.* Fouad, el S.; Mohamed, Z.

DIPLOMA IN VETERINARY HYGIENE.

Mills, D. W.

DIVISIONAL REPORT.

Midland Counties Division.*

JOINT MEETING WITH THE DERBYSHIRE DIVISION AT DERBY.

The quarterly meeting of the Midland Counties Division was held at the Midland Hotel, Derby, on Tuesday, June 8th, a later date than was originally fixed, the General Strike having interfered with the arrangements first made. The Derbyshire Division were invited to join the meeting, which they agreed to do, and, as a consequence, the attendance was much larger than usual.

The President of the Midland (Mr. J. O. Powley), this being his first meeting, issued an invitation to the two Divisions to be his guests at lunch, and at the conclusion of an excellent repast, his health was very heartily drunk, on the call of Mr. McKinna. Mr. McKinna said that Mr. Powley was well known and esteemed throughout the profession, and the good work he had done well merited the compliment which the Midland Division had paid him in electing him to preside over them.

Mr. POWLEY, acknowledging the toast, said that the honour was one which he appreciated very highly, and he was pleased to be so well supported as he was on that occasion.

In addition to Mr. Powley, there were also present: Messrs. E. Marrison (Bakewell, president of the Derbyshire Division), H. W. Steele-Bodger (Tamworth), G. E. Gibson (Newport Pagnell), E. O'Neill (Birmingham), J. A. McLauchlan (Stourport), T. H. Hobson (Leicester), H. E. Powell (Coalville), R. Lake (Ashby-de-la-Zouch), W. E. Blackwell (Towcester), R. L. Phillips (Loughborough), G. Eaton (Market Harborough), H. S. Cockburn (Eastwood), E. Wilkinson (Burton-on-Trent), G. R. Benbow (Leicester), T. Slipper (Sutton Coldfield), H. W. Dawes (West Bromwich), J. C. Deville (Uttoxeter), G. Howe (Buxton), G. J. Furness (Alfreton), A. Levie (Derby), J. A. Heather (Sandiacre), B. DeVine (Birmingham), W. J. Ironside (Sutton Bonnington), W. T. S. Atkinson (Castle Donington), P. M. Evershed (Nottingham), F. T. Prince (Ashbourne), H. McIntyre (Leek), J. McClemont (Derby), W. F. Aston (Shrewsbury), H. J. Dawes (West Bromwich, Hon. Secretary of the Midland Division), and O. V. Gunning (Tutbury, Hon. Secretary of the Derbyshire Division). Visitors present were: Professor J. Russell Greig (Edinburgh), Mr. J. McKinna and Mr. A. B. Fewings.

Apologies for unavoidable absence were announced from the following: Sir John M'Fadyean, Prof. Penberthy, Major Hobday, Messrs. J. Clarkson, W. Tart, E. Ringer, T. J. Brain, L. W. Heelis, C. Franklin, D. J. Anthony, R. Palmer, F. E. Somer, A. Crofts, J. Whyte, W. Beddard, R. L. Green, W. W. Grasby, G. Banham, H. S. Reynolds, J. Robertson, J. R. Carless, A. Hamilton, G. H. Barber, J. E. Hutchinson, E. Hall, W. Dale, W. Dale, jun., M. Tailby, G. Marriott, L. C. Tipper, H. B. Hiles, R. Hughes, H. Tudor Hughes, R. McGregor, B. Secker, J. W. Conchie, A. B. Forsyth, E. J. Barrowcliffe, L. C. Maguire, A. Renfrew, A. Renfrew, jun., C. Renfrew, D. Forwell, J. A. Connell, J. A. Hawksworth, E. Brayley Reynolds, J. Martin, T. Martin, C. W. Parkes, H. L. Pemberton, J. T. Allen, C. J. Clifford, J. V. Tyerman, R. C. Trigger, W. Trigger, J. A. R. Jones, T. Ludlow and T. Spencer, and others.

MIDLAND BUSINESS.

Prior to the joint meeting, the Midland Association met separately for the transaction of certain routine business,* Mr. J. O. Powley presiding. The minutes of the previous meeting were read and confirmed.

The President nominated Mr. Ambrose Robertson, of Stourbridge, for membership of the Division.

Mr. George Eaton, of Eastgates, Hallaton, Market Harborough, duly nominated at the previous meeting, was now elected a member, on the motion of the PRESIDENT, seconded by the HON. SECRETARY.

A motion stood on the agenda in the name of Mr. H. Tudor Hughes that Dr. T. C. Graves, M.D., B.Sc., B.S., F.R.C.S., L.R.C.P., M.R.C.V.S., be elected an honorary associate of the Association, and in the absence of Mr. Hughes, the motion was submitted by the Hon. Secretary. Mr. DAWES said that the high standing of Dr. Graves in the medical and veterinary world quite justified the Division in paying him this compliment, and Mr. DEVINE, in seconding, said Dr. Graves was too well known to them to require a special eulogy. The motion was unanimously carried.

Three representatives to serve on the Council of the National Veterinary Medical Association, together with the Hon. Secretary, were appointed as follows: the President (Mr. Powley), Messrs. W. H. Brooke (Handsworth), and R. Hughes (Oswestry).

The absence of the Hon. Treasurer (Mr. Brooke) was explained by the Hon. Secretary as being due to the serious illness of his father, and he moved that a message of sympathy be sent from the Division to Mr. Brooke. This was seconded by Mr. O'Neill, and carried.

A recommendation by the Council that Mr. Noel Pillers be invited to read a paper at the next meeting of the Division on "General Diagnosis" was unanimously agreed to, Mr. H. W. Dawes expressing the hope that Mr. Pillers could be induced to give a practical demonstration. It was further resolved that the next meeting be held in Birmingham, the time and place and the general arrangements to be left in the hands of the President, the Hon. Secretary, the Hon. Treasurer, and Mr. DeVine.

A further recommendation of the Council, which was also accepted, was that the Hon. Treasurer be empowered to pay the annual subscription of five guineas to the Victoria Benevolent Fund, together with the usual extra donation of five guineas.

* Received on July 1st.

* The report of the preliminary meeting of the Derbyshire Division has already been published.—Ed.

The late Sir Stewart Stockman. The PRESIDENT referred to the great loss which the veterinary profession had sustained through the death of Sir Stewart Stockman, with whom he had been associated, as a servant of the Board, for the last eighteen years. Sir Stewart, who was an honorary associate of that Division, had often attended their meetings and addressed them on various subjects. The least they could do was to send a letter of sympathy to Lady Stockman and the family, and it was his sad duty to move that this be done.

The HON. SECRETARY, in seconding, said it was the belief of those who knew Sir Stewart best that the great amount of work and worry of the last twelve months had hastened his end.

The motion was carried in the usual way.

THE JOINT MEETING.

MIDLAND PRESIDENT'S INAUGURAL ADDRESS.

The joint meeting of the Midland and Derbyshire Divisions followed, the chair being occupied by the Derbyshire President (Mr. Marrison).

Mr. POWLEY, the Midland President, delivered his inaugural address. He said: I have to thank you for the honour you have done me in electing me your President for the ensuing year, and to assure you that I will put forward my best endeavours to merit your trust, further the aims, and uphold the traditions of this—one of the oldest and most go-ahead of the Divisions of the N.V.M.A.

It is apparently expected of your President, on taking over the chair, that he will offer some remarks or criticisms on the politics or future of the Profession, and it might not be considered out of place if, on this occasion, one attempts to glimpse into the future, in view of certain pessimistic utterances which have recently appeared. To me, the prospects of the profession appear brighter than they have ever been, the dimmed spectacles of the pessimist offering no deterrent to my optimism.

Whereas in the horse days every newly-qualified student expected to engage in general practice, to-day there are many more avenues of work opened up which the veterinarian can follow with every prospect of success. Whilst the general practitioner is, and will always remain, the backbone of the profession, the avenues opened up in research into animal diseases, with their bearing on comparative medicine, the demand for state veterinarians, and local authority veterinarians—to confine oneself only to the Mother Country—will continue to increase; in fact, as one door closes another opens, action and reaction being always equal and opposite.

In research, the field presented is an enormous one, which is bound to absorb an increasing number of graduates whose natural bent is in that direction. To take only one species of animal, viz., the sheep, a practically uncharted sea of diseases awaits the efforts of the trained veterinary research worker. The sheep still remains the backbone of British agriculture, and without a prosperous sheep industry, British agriculture generally cannot prosper. Here is the field for collaboration between the trained clinician and research worker, for without the acute observation of the clinician the research worker cannot obtain the material on which to work. One could enumerate many other avenues opening up daily on these lines on the other domestic animals, but the one example suffices to point the way.

The Government has at last recognised the work and place of the veterinarian in the control of animal diseases as it affects the economic condition of the country, for, after all, with the exception of the various domestic pets, the whole question is one of economics, and one looks forward hopefully to the veterinarian consolidating his position in this sphere.

You will all have noted, during the course of the last week, an order issued by the Minister of Agriculture prohibiting the entry into this country of fresh meat carcases and offals, owing to the introduction of foot-and-mouth disease with such commodities. The annual value of these foodstuffs during the last few years has approximated £5,000,000, and if the British farmer will do his duty and produce this food within our own borders, it can only mean increased prosperity to British agriculture, with its concomitant reaction on the future welfare of the veterinary profession.

With our so-called increased civilisation there will be a greater call for trained veterinarians for local authority administration in collaboration with the state veterinarian. One can hear the general practitioner murmuring that this tolls his death knell, but I am convinced, with the increased value of our flocks and herds, that the practitioner will still have scope, and plenty of it, in which to exercise his brains and ability, and to obtain a reasonable competence.

As in the other professions, we have reached the day of specialisation, which will increase as the years roll on. This specialisation means a larger measure of co-operation with other scientifically-trained men not of the veterinary profession, but working for the same ends, and this co-operation can only lead to a fuller knowledge, by the outside world, of the value of the profession, thus reacting to its betterment and advancement.

One could continue in this optimistic strain, but having a limited time at our disposal, sufficient has, I think, been said to justify the optimist.

We must not lose sight of the fact that we are a very young profession, practically only in our infancy, and progress is, as a rule, a slow business. In my own particular line, the realm of the state veterinarian, recognition has only been gained after hard and strenuous labours.

In this age of acute competition, whilst opportunities are perhaps more numerous than ever, with men from other professions stepping in and doing work which one considers is rightly our province, the veterinarian must prove his worth and ability before being accepted by the public and the "powers that be" as the one individual fitted for the job he seeks. It is not sufficient to make the statement that he is a veteri-

narian and must be given certain work. Justice demands that he prove himself capable of carrying out such work in a more capable and economic manner than the individual he asks or attempts to supersede. The services of the veterinarian, unlike those of the medical man, are judged almost entirely on their economic value, sentiment playing a very small part indeed.

To get back to more parochial affairs, I would take this opportunity of urging members of this Division of the N.V.M.A. to take a keener interest in its affairs. As boys, some of us used to indulge in a certain recreation known as "Pass it on." The thing to be passed on might be a kick on a certain part of the anatomy of the individual selected as a passer, or it might be a pinch; sometimes it was a note to be passed round the class under the observant eyes of the teacher without being discovered. As responsible members of the Association we should still be playing that boyish game, but instead of passing on such futile things as kicks, we should be passing on to each other the knowledge and experiences gained in the carrying out of our various duties. By doing this we should not only enhance the reputation of our own Association but also of the whole profession.

Professor J. RUSSELL GREIG, of the "Dick" College, Edinburgh, then presented a paper on "Milk Fever," which was followed by an excellent discussion. (Both paper and discussion receive separate publication.—Ed.)

On the motion of Mr. MARRISON, seconded by Mr. POWLEY, Prof. Greig was very cordially thanked for his attendance and for the paper he had written.

An Interesting Specimen. Mr. EATON produced for inspection the testicles of a seven weeks' old calf, one of which was very abnormal. It was believed to be a chrondroma.

Derbyshire Division's Hospitality. At the conclusion of the meeting, tea was provided by members of the Derbyshire Division, and Mr. Powley, during the meal, expressed the thanks of the Midland members for this hospitality. He said the very fraternal spirit which had pervaded the proceedings throughout the day must have been a matter of satisfaction to them all.

H. J. DAWES,
Hon. Secretary.

NOTES AND NEWS.

The Editor will be glad to receive items of professional interest for inclusion in these columns.

July 27th-30th.—N.V.M.A. Congress at Dublin.

NOTICE TO CONTRIBUTORS.

Contributors are reminded that they are entitled to fifteen free copies of the *Record* containing their articles. If they so desire, however, they can be supplied with thirty printer's proofs in lieu thereof. A note as to their wishes in this respect should *accompany articles*, and no application for either copies of the *Record* or proofs can be entertained which is not received within a fortnight of the date of arrival of articles at the office.

Army Veterinary Service.

LONDON GAZETTE. WAR OFFICE. TERRITORIAL ARMY.

July 13th—Major E. Franklin, O.B.E., T.D., to be Lieut.-Col. (July 14th). Major P. J. Simpson, D.S.O., T.D., F.R.C.V.S., to be Lieut.-Col. (July 14th). Capt. J. C. Broad resigns his commission and retains his rank (July 14th). Lieut. A. K. Cameron to be Capt. (July 4th). Lieut. W. J. Leyshon to be Capt. (July 14th).

R.C.V.S. OBITUARY.

HODGMAN, John Alexander, Barnsley, Yorkshire. Graduated N. Edinburgh, 21st April, 1885. Died 19th July, 1926.

CORRESPONDENCE.

The Submission of Material for Toxicological Analysis.

TO THE EDITOR OF THE VETERINARY RECORD.

Sir,—In your issue of the 17th inst. appears a report of a paper by Mr. T. Knowles entitled "British Ragwort Poisoning of Cattle and Horses," and of the discussion which followed the reading of the paper. In the discussion Mr. Wardrop quoted a case in which one analyst detected lead and arsenic in a specimen of "material from a cow," whereas "another found neither!" Mr. G. Lockwood remarked that "one analysis showed lead in abundance in water and the other showed none in it, both samples of water being obtained from exactly the same source."

In order that such contradictions in analytical results may be obviated as far as possible, it is desirable to take certain precautions, of which the following appear to me to be the most important:—

Firstly, toxicological analyses should be entrusted only to analysts qualified to perform this special type of work. I know that specimens have been sent for analysis to the nearest chemist's shop.

Secondly, the material selected for analysis should be representative samples of the organs and contents. Sometimes, relatively large amounts of arsenic are found in the contents of a cow's first stomach, although there may be no detectable quantity in the fourth.

Thirdly, the approximate quantities of poison separated should be recorded in the analytical reports. Such vague phrases as "lead in abundance," "good traces," "faint traces," are of little value and should be avoided.

Each test possesses its limit: "delicate" tests will detect amounts which may not be found by other tests. Thus, one analyst may obtain a positive result by his refined technique, whilst another may fail to obtain the same result owing to the application of less sensitive tests. Although numerous analytical results are mentioned in your report of the above discussion, in not a single case is any quantity recorded.

Even when the toxicologist is in possession of the amounts of a poison separated from viscera, his task is by no means ended. The interpretation of the analytical results (taken in conjunction with the clinical observations) is a matter which has long been a subject of discussion among toxicologists but one which cannot be adequately dealt with in a letter.—Yours faithfully, G. W. CLOUGH.

Royal Veterinary College,
Camden Town.
July 19th, 1926.

Animal Dispensaries and Clinics.

TO THE EDITOR OF THE VETERINARY RECORD.

Sir,—There is much to be said for Mr. Pottie's views in your issue of 10th July.

The public should be given to understand that if highly-trained qualified men often find difficulty in diagnosing and treating the diseases of animals it is hopeless and

inhumane for laymen to attempt it. Apart from the effect these places may have on our profession, it is only right that the animals themselves should be protected by putting clinics and boarding homes under proper control and in charge of a veterinarian. Recently I was asked by the person in charge of a " home " not to open a branch in the district as it would undoubtedly do them a lot of harm, and they really had to make their place pay. I think this summed up the actual state of affairs.

Heaven knows we are poorly paid enough, and the cry of expensive veterinary fees is despicable propaganda. During my many years of veterinary practice at home and abroad, I have never encountered or heard of a veterinarian who does not gratuitously treat the animals of the deserving poor, and I am convinced that many of these clinics are unnecessary.

I would suggest that steps be taken, say, by the " National," to form an " Animals' Veterinary Protective Society." Until funds are available to establish centres under a whole-time veterinarian, practitioners and retired members should devote a portion of their time to this welfare work under the direction of the " Society." Let us make a determined effort to save suffering animals from the hands of unqualified persons, and the parasites of the misinformed and gullible public. I am prepared to start the campaign by using a place I have on the edge of a working-class district for this purpose if a retired veterinarian will attend regularly to assist me.

The district shall be circularised, and if any local practitioners are already assisting lay clinics they will be asked to withdraw their services and support, and give them to us to help towards efficiency.

The march of progress is rapid, competition is keen, and still we slumber in the bed of politics and policy. When will we wake up ?—I am, Sir, faithfully yours, REG. F. WALL.

128 Queen's Road,
Bayswater,
London, W.2.
July 20th, 1926.

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TO THE EDITOR OF THE VETERINARY RECORD.

Sir,—Professors Gorton and Hobday could not have selected a more opportune time for bringing before the notice of the profession the question of as fair veterinary treatment being provided for the sick animals of the poor as for those of the rich, and I agree absolutely with the remarks in the July editorial of the *Veterinary Journal* that, " For the sake of the animals themselves, on grounds of humanity, apart from the fact too, that the money subscribed by the general public in response to widespread (and often harrowing) appeals, is really a Public Trust, unskilled men and women (however well intentioned), have no right to systematically inflict pseudo-treatments by guesswork on living creatures who are powerless to protest." The Editor also adds, " The diagnosis of disease cannot possibly be accurately made by untrained and unscientific men, and it stands to reason that those who have devoted at least five probationary years of their lives to the study of animal ailments, must be in a better position to give relief, than those whose ideas have no scientific foundation whatever."

In this district we have a society called " The Poor People's Animals' Shelter and Dispensary," founded by a local lady and kept up by local efforts and subscriptions.

The lady asked if she might use my surgery until such time as they could purchase a hospital for themselves. I consented on condition that all the other veterinary surgeons in the town were asked to do the same. I wrote to each of them, and the reply in each instance was favourable. In addition to being willing to help such a good object, advertisements were inserted in the local newspaper to the effect that any poor person having a sick animal needing treatment, should apply by letter either to this lady or to the R.S.P.C.A. inspector; either of whom, upon being satisfied that the case was a genuine one, could issue a ticket to whichever veterinary surgeon was in the neighbourhood, and if the owner could pay a little towards the treatment, the amount would be stated on the card.

This scheme has now been working for about five months and, so far as I know, is giving satisfaction all round, and I should be pleased to give further details to any of my colleagues who thinks of starting anything of the kind in his own respective district.

It certainly has already demonstrated to us the wisdom of an impartial investigation beforehand into the circumstances of the so-called " poor owner "; as one finds in this, as in every scheme, a number of people who will try, without a semblance of a blush, to get something for nothing.—Yours faithfully, P. THRALE, M.R.C.V.S.

George Street,
Croydon.

" The Toxic Idiopathies."

TO THE EDITOR OF THE VETERINARY RECORD.

Sir,—In *The Veterinary Record* of June 19th (*q.v.*) you kindly published a letter from me asking if there are authentic cases in the animal world of what amongst Humans are known as The Toxic Idiopathies. In these illnesses the sufferer is normal in all other respects, but reacts acutely to some animal or vegetable substance (*e.g.*, in the food or in the atmosphere) which is perfectly harmless to all other people. It is as if the patient had an hereditary anaphylaxy.

It would be of the greatest assistance to research (1) to know for certain if animals ever have such illnesses; or (2) to be permitted to make some mild experiments on such animals, *e.g.*, to take a small sample of blood for testing; or perhaps (3) to acquire such animals for breeding purposes.

So far there has been no reply in *The Veterinary Record*, and I have only had one private reply which reported the case of a dog made ill by some tainted veal. This is not what I want.—Yours faithfully, J. FREEMAN.

Institute of Pathology and Research,
St. Mary's Hospital,
Paddington, W.2.
14th July, 1926.

" The More Important Bacterial and Protozoal Diseases of Poultry."

TO THE EDITOR OF THE VETERINARY RECORD.

Sir,—I wish to draw the attention of your readers to a statement made in my paper published in the Congress Handbook, 1926. I refer therein to earlier findings of Rettger and his co-workers, but I omit to state that, as a result of later experiments, which are already mentioned in part in my paper, they found contrary indications.

I should be glad if your readers would make the following alteration on page 60, lines 32 to 35. The sentence: " Rettger, Kirkpatrick and Stoneburn (16) . . . with infected birds." should read: " They find that the results of their experiments indicate strongly that the transmission of infection from hen to hen through infected litter and by ordinary contact and association is rare, if indeed it occurs at all."—Yours faithfully, JOHN P. RICE, B.Sc., M.R.C.V.S.

Belfast.

The Editor acknowledges the receipt of the following —

Reports of proceedings from the Secretaries of the Central, Eastern Counties, and Lancashire Divisions, and of the Frank Garnett Memorial, and Victoria Veterinary Benevolent Funds.

Communications from Messrs. Ll. E. W. Bevan, H. Kirk, W. J. Leyshon, A. New and R. E. L. Penhale.

National Veterinary Medical Association of Great Britain and Ireland.

EDITORIAL OFFICE: 10 Gray's Inn Square, London W.C.1.

All communications relative to the literary side of the Veterinary Record must be addressed to the Assistant Editor, " Veterinary Record," 10 Gray's Inn Square, W.C.1